

# THE REVIEW

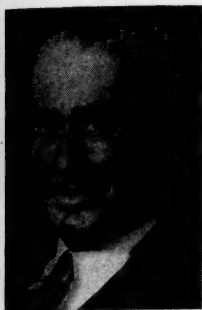
DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume XIV

OCTOBER, 1941

No. 8

## METAL CONGRESS FEATURES DEFENSE AIDS



O. E. Harder

### A Message From the President

To the Members of the American Society for Metals and Members of the Cooperating Societies

NATIONAL DEFENSE—shortages—conservation—substitution—these are the chief concern of the metal industry today. And so the entire program of the National Metal Congress and Exposition, to be held in Philadelphia Oct. 20 to 24, has been rearranged to include these subjects. Experts in every field affected by the defense program will discuss with Government representatives problems of conservation and substitution, while new ideas for aiding production will be displayed and illustrated at the National Metal Exposition.

A week spent at the Metal Congress—or if that is impossible in these busy times, at least a few days—will give you new ideas for solving your shortage and substitution problems. More important, perhaps, it will give you an opportunity to serve your country by contributing your thought in this national emergency. Exchange of ideas and cooperation have characterized A.S.M. and have done much to advance industry and to establish your Society; and now teamwork can be of great aid to national defense.

Read the program in these pages and make every effort to attend those meetings and events from which you will derive the most benefit and be able to contribute most usefully.

October 1, 1941

OSCAR E. HARDER, President  
American Society for Metals

### A.S.M. Technical Sessions Will Study Theoretical Angles

The theory behind the formation of alloys, behind the fundamentals of heat treating, and behind the mechanics of testing and inspection is the chief topic of the technical sessions of the American Society for Metals during the National Metal Congress the week of Oct. 20.

In these times when research is so important to the new requirements of defense work, a full program of 60 papers on subjects of greatest significance is scheduled for the five days of the Congress.

The papers are written by the leading engineers and research men in the metal field. These are the men whose long-continued and painstaking laboratory and plant investigations have made possible the rapid development of substitutional methods and alloys necessitated by the present national emergency.

All A.S.M. technical sessions will be held during the mornings to leave afternoons and evenings free for the defense group meetings sponsored by the Society. Three sessions will be held simultaneously Monday, Tuesday, Thursday and Friday mornings, in the Benjamin Franklin Hotel, which is official headquarters for the Society during the convention.

These technical sessions will adjourn promptly at 11:30 so that all present may assemble in the ballroom of the

Hotel to hear an address by a high Government official.

Afternoon defense meetings and lecture courses will be held at Convention Hall to facilitate attendance at the National Metal Exposition.

Two other events of importance to A.S.M. members are the Annual Meeting and Campbell Memorial Lecture to be held on Wednesday morning, Oct. 22, and the Annual Banquet Thursday evening. Both events will be held in  
(Continued on page 3)

### PASS THIS ON!

This issue of THE REVIEW is being mailed to 25,000 members of the engineering profession interested in metals. Some of you may receive two or three copies, so please pass them on.

Read the technical programs, and pay particular attention to the defense group meetings. Plan to attend as many as you can. And don't miss the Exposition! Then pass this copy on to someone else you know will be interested.

### Group Meetings on Conservation Planned for National Convention

An intensive survey of the situation as it exists at the present time concerning the strategic and critical metals will be provided by the National Metal Congress and Exposition to be held in Philadelphia, Oct. 20 through 24.

High in interest on the Congress program will be a series of national defense group meetings on defense problems, conservation and substitution sponsored by the American Society for Metals.

### Metal Show Will Be Largest in History

Tuned to the theme of speeding production for defense, the 23rd National Metal Exposition, to be held in Philadelphia Oct. 20 through 24 concurrently with the National Metal Congress, will be the largest in history.

More than 300 leading American firms will have space in the Exposition, which is to be held in Philadelphia's mammoth Convention Hall and Commercial Museum. These firms will display their products and processes in a way as to emphasize how they will aid defense production.

Featured by the steel companies and by the producers of non-ferrous alloys will be materials developed to replace the ever-scarcer strategic and critical metals, and ways of conserving present supplies. Processers and equipment manufacturers will show how to fabricate, heat treat and weld the newer materials with minimum expenditure of time and money. Many of the exhibits will feature actual equipment in operation.

The Exposition will be open daily from 12:00 noon until 10:30 p.m., with the exception of Thursday when it closes at 6:00 p.m.

Admission is free to all members of technical societies and to those holding executives' passes distributed by exhibiting firms. Members of any technical society can register upon presentation  
(Continued on page 3)

These meetings will be held at Convention Hall every afternoon during the five days of the Congress and the first three evenings, and will be in addition to the regular A.S.M. technical sessions. The latter will all be held during the mornings at the Benjamin Franklin Hotel.

Defense problems will also be emphasized in the technical programs of the American Institute of Mining and Metallurgical Engineers, the American Welding Society, and the Wire Association, who are cooperating in the Metal Congress.

The A.S.M. defense meetings are to be forums on such subjects as alloy steels, alloy castings, molybdenum high speed steels, shells, aluminum and magnesium in defense, copper and its alloys, stainless and heat resisting steel, bearings, tool steels, and inspection of metals.

Each meeting will have a chairman, a summarizer, and a representative from the Government who will present  
(Continued on page 2)

### OPM Division of Contract Distribution to Have Space At National Metal Show

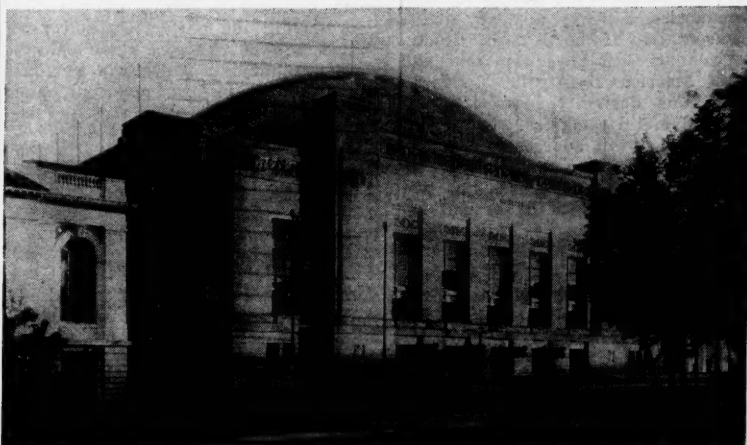
The Division of Contract Distribution of the Office of Production Management, in the 3rd Federal Reserve District, has accepted an offer of the American Society for Metals to participate in the National Metal Exposition which will be held in Convention Hall in Philadelphia from Oct. 20 through 24.

The Division of Contract Distribution, which is the successor of Defense Contract Service, OPM, is rapidly expanding the work of defense production through promotion of sub-contracting of defense orders.

The service in the 3rd Federal Reserve District was organized last spring under the leadership of Dr. Thos. S. Gates and Orville H. Bullitt, and the entire District which extends throughout most of Pennsylvania, half of New Jersey and all of Delaware is now well established under 14 regional committees consisting of the leading industrialists in this part of the country. Offices have been set up in Philadelphia, Chester, Trenton, Camden, Wilmington, Norristown, Allentown, Reading, Lancaster, York, Harrisburg, Wilkes-Barre, Scranton, Williamsport and Johnstown.

At the National Metal Exposition the Contract Distribution Service will occupy  
(Continued on page 16)

### Convention Hall — Site of Metal Exposition



Philadelphia's Convention Hall and Commercial Museum Has 112,000 Sq. Ft. of Floor Space for the Record-Breaking 23rd National Metal Exposition.

### METAL CONGRESS EVENTS

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## THE REVIEW

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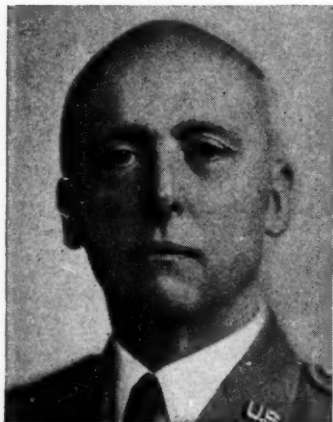


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RAY T. BAYLESS.....Editor  
M. R. HYSLOP.....Managing Editor

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## Prominent at Show



Colonel Glenn F. Jenks, President of the American Welding Society, Will Take an Active Part in Technical Programs at the Metal Congress.

## A.W.S. to Show How Welding Speeds Military Production

With welding, cutting and allied processes established as effective tools in speeding production of military and naval equipment of all kinds, defense will be practically the keynote of this year's annual meeting of the American Welding Society.

Engineers, executives and production men from every part of the country will gather for the meeting at the Bellevue-Stratford Hotel in Philadelphia from Oct. 19 to 25.

During the week-long meeting, leading authorities on various phases of welding and cutting will present more than 65 technical papers. Individual sessions will be devoted to shipbuilding, training of operators, aircraft and automotive production, fabrication of machinery, fundamental research, and resistance welding. One entire session will deal exclusively with defense work.

In addition to the technical sessions at the Bellevue-Stratford, and the welding exhibits at Convention Hall, other prominent events scheduled for this year's meeting include the President's reception on Sunday afternoon, October 19, the presentation of medals and awards on Monday morning, the annual banquet on Thursday evening, and a plant inspection trip on Friday afternoon.

The complete program is printed on page 10 of this issue.

## Ordnance Officers Take Part in Program On Inspection of Metals Wednesday Night



Dr. Sullivan

Dr. John W. W. Sullivan, Head, Inspection Division, Cleveland Ordnance District, is Chairman of the A.S.M. National Defense Group Meeting on Inspection, While Brig. Gen. R. H. Somers, Assistant Chief of Industrial Service, Inspection, Office of Chief of Ordnance, Will Give a Talk on Army Ordnance Inspection.



Brig. Gen. Somers

## Army, Navy, Marine and Aircraft Inspection Are Some of Subjects to Be Treated

Army and Navy men will have a lot to say in the program on "Inspection of Metals" planned for one of the A.S.M. National Defense Group Meetings during the Metal Congress.

This particular meeting will be held Wednesday, Oct. 22, at 8:00 p.m. in the ballroom of Convention Hall. Leader of the discussion will be Dr. John W. W. Sullivan, head, Inspection Division, Cleveland Ordnance District.

Another prominent Army representative, who will talk on Army ordnance inspection, is Brig. Gen. R. H. Somers, assistant chief of industrial service, inspection, Office of the Chief of Ordnance. General Somers has held many important military posts including Commanding Officer of Watervliet Arsenal, chief of the Artillery Division of the Ordnance Department, assistant professor of military science at M.I.T., and secretary of the Army Ordnance Association.

Marine construction inspection will be covered by Capt. Ralph T. Hanson, U.S.N., supervisor of shipbuilding, Cramp Shipbuilding Co.; and Capt. K. J. Soderberg, Civilian Personnel Division, Office of Chief of Ordnance, will talk about training of inspectors.

On the civilian side will be METAL PROGRESS Editor Ernest E. Thum, whose subject is "Principles of Inspection of Non-Ferrous Materials", and Earl Blaine, chief inspector, E. G. Budd Mfg. Co., who will talk on ferrous inspection principles.

Also discussed will be inspection of aircraft and aircraft engine materials, and Navy ordnance inspection. W. J. Jeffries, chief engineer, Philadelphia Ordnance District, will be the summarizer.

## Army, Navy &amp; Air Force Representatives to Speak

A high ranking officer of the Army, a representative of the Bureau of Naval Aeronautics, a Navy admiral, and a representative of the Office of Production Management have been scheduled by the American Society for Metals for brief talks during the week of the National Metal Congress.

These men will address meetings to be held at 11:30 a.m. following the morning technical sessions, and will stress the general needs of national defense. Their speeches will not be technical in nature.

The talk by a general officer of the Army will be given on Monday morning, and a commander of the Naval Air Force is scheduled for Tuesday. Thursday's meeting will be addressed by an admiral of the U.S. Navy, and a representative of the OPM will talk on Friday morning.

These meetings are in addition to the afternoon and evening national defense group round table discussions on conservation and substitution.

## Conservation Group Meetings Planned

(Continued from page 1)

The latest information on the status of the scarce materials involved in the clinic and the status of substitute materials, also indicating the trend and how industry can assist in and adjust itself to the present shortages.

## Short Talks Precede Discussion Period

The first part of the clinic will hear the presentation of prepared, short, concise talks on the subject under consideration covering a period of 45 to 60 min. The remainder of the session will be used for an open discussion and question period with the speakers on that particular program seated on the platform and acting as members of an information panel.

These group meetings will be "off the record" and no stenographic notes will be taken.

Afternoon and evening meetings will be held daily Monday through Friday at 2:30 p. m. and at 8:00 p. m. in Convention Hall. No meeting is scheduled for Thursday evening which is left open for the annual banquets of the American Society for Metals and the American Welding Society, to be held at the Benjamin Franklin and Bellevue-Stratford Hotels respectively. The exposition will also close at six o'clock on that day.

The complete program of the meetings is given on page 5.

## Officers to Give Reports At A.S.M. Annual Meeting

Official notice has been given to all members of the American Society for Metals that the annual meeting of the Society will be held in the Benjamin Franklin Hotel, Philadelphia, on Wednesday morning, Oct. 22 at 9:30 a. m.

At that time the president, secretary and treasurer will give their annual reports covering activities of the Society during the past year, and new officers will be elected. These officers were nominated in May by a committee appointed by the president, and their names published in the May issue of THE REVIEW.

The meeting will be followed by the presentation of the Campbell Memorial Lecture by R. F. Mehl.

## Jeffries to Talk for Kiwanis

Dr. Zay Jeffries, past president A.S.M., and chairman of the Metals Conservation and Substitution Group, Advisory Committee on Metals and Minerals, National Research Council, will talk before the Philadelphia Kiwanis Club at the Bellevue-Stratford Hotel on Tuesday noon, Oct. 21. Dr. Jeffries is technical director of the lamp department of General Electric Co., Cleveland.

## Williams Leads First Defense Group Meeting

The first of eleven "A.S.M. National Defense Group Meetings on Defense Problems, Conservation and Substitution", to be held during the National Metal Congress in Philadelphia, will cover the low carbon alloy steels of the case-hardening variety.

This session will be held in the ballroom of Convention Hall at 2:30 p.m. on Monday, Oct. 20.

Gordon T. Williams, metallurgist for Deere & Co., Moline, Ill., will be leader of the discussion. Author of a book soon to be published by the American Society for Metals entitled "What Steel Shall I Use?", Mr. Williams is a practical metallurgist who keeps close to shop problems.

The meeting will open with a talk by a representative of the Conservation and Substitution Committee, and this will be followed by 5 or 10-min. prepared talks on commonly used alloy steels that are scarce or unobtainable, suggestions for substitutes, comparison of the scarce alloys and the substitutes on various practical points, and discussions of hardening methods and design.

The speakers on these subjects will then act as an information panel during an open discussion and question period. Finally, a summary of the whole subject will be given by O. W. McMullan, who is metallurgist for Youngstown Sheet & Tube Co.



G. T. Williams

## Shirer Is Speaker At A.S.M. Banquet



William L. Shirer

William L. Shirer, famed foreign correspondent and CBS news commentator, author of the best-selling "Berlin Diary", will be the principal speaker at the annual banquet of the American Society for Metals, to be held in the ballroom of the Benjamin Franklin Hotel, Philadelphia, on Oct. 23.

As head of the Berlin staff of CBS, Mr. Shirer has been heard daily until this past winter when he returned home. He knows Europe as only one can who has lived there, and his observations at the banquet will be based on his everyday work for 15 years.

Other features will be the award of the Albert Sauveur Achievement Medal, the Henry Marion Howe Medal and the Past President's Medal.

Tickets for the banquet will be \$5.00 and may be secured at the Benjamin Franklin Hotel or the A.S.M. headquarters in Convention Hall. Tables will seat ten. Advance reservations should be sent to the American Society for Metals, 7301 Euclid Ave., Cleveland.



## Defense Luncheon to Be Important Event of Wire Association

Most important event in the program of the Wire Association for the National Metal Congress is undoubtedly the National Defense Luncheon to be held Tuesday, Oct. 21, at the Philadelphia Hotel.

The entire afternoon will be devoted to this meeting, which will be on the theme of "National Unity and National Defense". Speakers will include a representative of the Government, of the Army, the Navy and of industry.

Members and guests of all cooperating societies are invited to attend this luncheon. Ladies are also invited.

Among the other outstanding features of the four-day program will be the address by Frederick A. Westphal, past president of the Wire Association on Monday afternoon and a paper by Kenneth S. Wyatt of Phelps Dodge Copper Products Corp., outlining what the cable industry in the United States has done for national defense.

The Mordica Memorial Lecture by Kenneth B. Lewis on Tuesday morning will undoubtedly create a great deal of interest since it will probably include some comments on the Roosevelt administration and industrial policy.

The Smoker, which will be held Wednesday evening, Oct. 22, at the Hotel Philadelphia, will be up to its usual standard. Members of cooperating societies may secure tickets through members of the Wire Association.

Headquarters for the Wire Association are at Hotel Philadelphia where informal gatherings and discussions will be held daily during the convention from 9:00 a.m. to 11:00 p.m.

There will be a registration fee of \$5.00 for attending the sessions. The complete program is printed on page 8.

## Technical Sessions To Study Theory

(Continued from page 1)

the ballroom of the Benjamin Franklin. Scheduled for Thursday and Friday mornings is a symposium on "Controlled Atmospheres" consisting of 11 papers on every aspect of the subject.

An educational course of five lectures on "Heat Flow in Metals" is another outstanding feature. These lectures will be presented every day at 5:00 p.m. by Dr. J. B. Austin of United States Steel Corp. Research Laboratories, with the exception of Friday, when the final lecture will be given at 2:30 p.m.

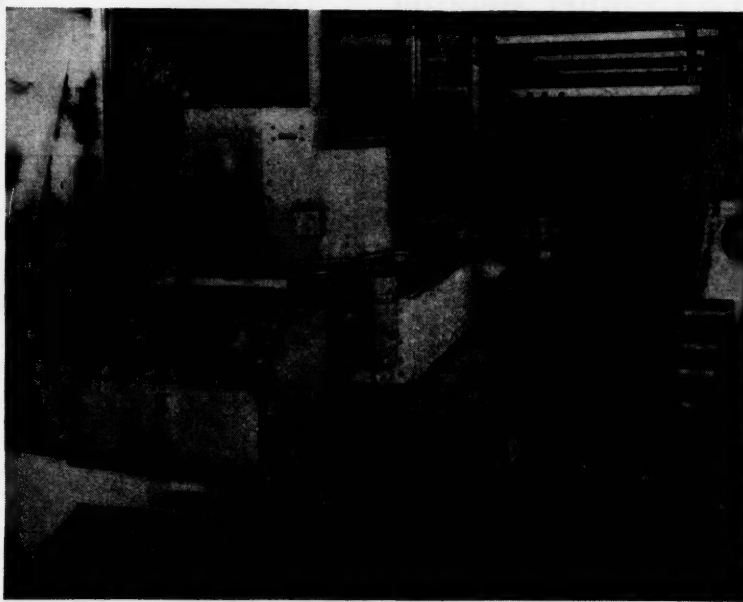
A second course of three lectures on "Hardness and Hardness Measurements" will be particularly timely in view of the many defense workers concerned with inspection of metals. Professor S. R. Williams of Amherst College is the lecturer for this course, which is scheduled for Convention Hall on Monday, Tuesday and Wednesday evenings at 8:00 p.m.

The Canadian Luncheon on Tuesday, Alumni Luncheons on Wednesday, and Chapter Chairmen's Breakfast on Wednesday, are other features of the week-long program.

## Bring Membership Cards

Members of the A.S.M., A.I.M.E., A.W.S., Wire Association, or any other technical society should be sure to bring their membership cards to the National Metal Congress in Philadelphia, Oct. 20 through 24. Membership cards are required for free admission to the National Metal Exposition and for enrollment in the A.S.M. lecture course on "Heat Flow in Metals."

## Tanks Built at Plant Near Philadelphia



Twelve-ton Tanks on the Assembly Line at American Car and Foundry Plant at Berwick, Pa., Near Philadelphia. Known as the M2A4's, they are heavily armored but easily maneuvered. American Car and Foundry Co. will have an exhibit in the National Metal show of some features of tank manufacture.

## Metals Divisions of A.I.M.E. Have Meeting During First Three Days of Congress

The regular fall meeting of the two metals divisions of the American Institute of Mining and Metallurgical Engineers will be held in Philadelphia on the first three days, Oct. 20 to 22, of the National Metal Congress in Philadelphia.

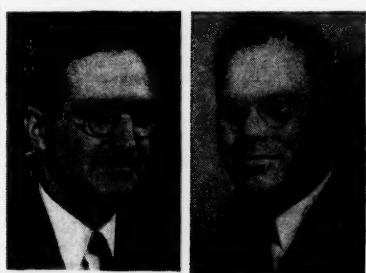
Headquarters for these divisions—namely, the Institute of Metals and the Iron and Steel Division—will be at the Ritz-Carlton Hotel.

Technical sessions begin Monday morning and continue through Wednesday afternoon. As usual, no sessions are scheduled for Wednesday morning, when the Campbell Memorial Lecture of the A.S.M. will be given.

The annual informal dinner of the two divisions will be held on Tuesday. Charles H. Herty, Jr., chairman of the Iron and Steel Division, will be in charge and act as toastmaster, and Donald K. Crampton, chairman of the Institute of Metals Division, will make the response.

"Building Combat Tanks for the United States Army" will be the subject of the speech by George K. Bradford, Jr., general superintendent, Ordnance Division, American Car and Foundry Co., which will be the main event of the dinner.

One of the features of the full and varied technical program is the in-



C. H. Herty  
Chairman  
Iron & Steel Div.  
D. K. Crampton  
Chairman  
Inst. of Metals

formal round table discussion of order-disorder phenomena led by William Shockley of Bell Telephone Laboratories, who has agreed to make this specialty of the physicists clear to the metallurgist. The role of order-disorder in the constitution of alloy systems has aroused much interest of late; on Tuesday afternoon, Oct. 21, all of its intricacies will be laid bare.

Nearly all of the papers on the program will be preprinted. Most of these papers will have been published in *Metals Technology* and will be in the hands of all members before the meeting. Others will be available as preprints at Philadelphia. Written discussion is invited.

The detailed program will be found on page 8.

Francis B. Foley, superintendent, research department, The Midvale Co., is chairman of the local committee for the Philadelphia meeting, and Leland R. Van Wert, metallurgist, Leeds & Northrup Co., is vice-chairman.

## Metal Show Is Largest

(Continued from page 1)

of their membership cards. Such registration provides admission to the Congress and Exposition for the entire week, as does also the registration provided by the executives' passes.

Registration fee for those who do not have membership in any of the technical societies or who do not have guest passes distributed by the exhibitors will be 50 cents for one day or \$1.00 for the five days.

## Manufacture of Shells Is Timely Meeting Topic

"The Manufacture of Shells" is the timely and highly important subject of one of the defense group meetings sponsored by the A.S.M. during the National Metal Congress.

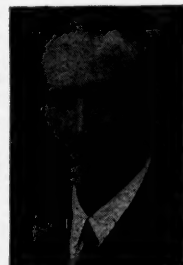
This meeting, which will be held at 8:00 p.m. on Monday, Oct. 20, in room 300 of Convention Hall, will be led by Arthur F. Macconochie, head of the department of mechanical engineering of University of Virginia.

Shell manufacture is not a new field but a long-time preoccupation with Professor Macconochie. Born a Scot, he was supervisor of the Royal Ordnance Factories, Woolwich Arsenal, during the first World War, where he redesigned diving shell for submarine attack and shell-making machinery.

Later he was designer with Vickers, makers of machine guns. Since 1923 he has been at University of Virginia, teaching various mechanical, metallurgical and allied engineering subjects.

As a special representative of the American Society of Mechanical Engineers, he recently organized a series of conferences on high explosive shell manufacture for the Ordnance Department in Washington and for manufacturers of shell-making equipment.

The meeting on shell manufacture will have brief prepared talks on shell steel, forged shells, heat treatment, sand blasting, machining of shells, and cartridge cases. A vigorous discussion period should materialize under Professor Macconochie's leadership.



A. F. Macconochie

## All Alumni of Technical Schools Invited to Attend Luncheons on Wednesday

Alumni luncheons are again scheduled by the leading technical colleges and universities of the country as a feature of the National Metal Congress. These luncheons will all be held on Wednesday, Oct. 22, at the Benjamin Franklin Hotel. Colleges sponsoring luncheons are:

- Carnegie Institute of Technology
- Massachusetts Inst. of Technology
- Lehigh University
- University of Michigan
- Case School of Applied Science
- Missouri School of Mines and Met.
- University of Minnesota
- Yale University
- University of Pennsylvania
- Purdue University
- Ohio State University
- Pennsylvania State College
- Rensselaer Polytechnic Institute
- University of Cincinnati
- University of Wisconsin

Reservations will be taken on Monday and Tuesday, Oct. 20 and 21, at the registration desk at the Benjamin Franklin Hotel or at Convention Hall. Tickets may also be purchased at the entrance to the luncheon rooms on Wednesday. The price for the luncheons will be \$1.25 per person.

Advance reservations for the Missouri School of Mines and Metallurgy luncheon should be sent to Prof. C. Y. Clayton, Box 248, Rolla, Mo.

All alumni of the schools listed may feel free to attend these luncheons. This notice is their invitation.

## Campbell Lecturer



Robert F. Mehl

Robert F. Mehl  
Will Present A.S.M.  
Memorial Lecture

"By his many successful investigations into the physical and chemical properties and behavior of metals and alloys, and especially by his invention and development of gamma ray radiography, he has rendered extraordinary service to American industrial enterprise."

So stated the citation accompanying the honorary degree of D.Sc. awarded by Franklin and Marshall College a few years ago to Robert F. Mehl.

Dr. Mehl, who is head of the department of metallurgy and director of the Metals Research Laboratory at Carnegie Institute of Technology, will present the annual Campbell Memorial Lecture of the A.S.M. during the National Metal Congress in Philadelphia.

The lecture will be held immediately following the annual meeting of the Society on Wednesday morning, Oct. 22, in the ballroom of the Benjamin Franklin Hotel.

While Dr. Mehl's subject has not yet been announced, his reputation as the instigator of much original research work and as the author of over 60 papers on constitution of alloys, aging, decomposition of austenite, diffusion and similar subjects guarantees that some new and interesting information will be forthcoming.

Mehl received his Ph.D. from Princeton University in 1924 where he served as Proctor fellow in chemistry. His academic experience also includes a term as head of the department of chemistry at Juniata College and as national research fellow at Harvard. From 1927 to 1932 he was superintendent of the division of physical metallurgy, Naval Research Laboratory, and then assistant director, research laboratories, American Rolling Mill Co. He has been at Carnegie Institute of Technology since 1932.

## Chapter Plans Trip to Congress

Baltimore Chapter A.S.M. is planning as its October meeting a group trip to the National Metal Exposition on Monday, Oct. 20. Private railroad cars are being chartered for the group and the round trip tickets will cost only \$2.85. Stop-over privileges are included in this rate.

## No Plant Inspection Trips

No planned plant inspection trips have been arranged by the American Society for Metals at this year's National Metal Congress and Exposition in Philadelphia.

Harder and Bates  
To Conduct Meeting  
On Bearing Metals

A.S.M. National President Oscar E. Harder, assistant director, Battelle Memorial Institute, will lead the A.S.M. National Defense Group Meeting on "Bearing Metals", to be held Thursday, Oct. 23, at 2:30 p.m. This subject is one of several in which Dr. Harder has specialized in recent years.

A. Allan Bates, manager, chemical and metallurgical department, Westinghouse Electric & Mfg. Co., will be the summarizer.



A. A. Bates

Every type of bearing which now presents a conservation or substitution problem will be discussed by a well-qualified expert.

For instance, Carl E. Swartz, metallurgist, Cleveland Graphite Bronze Co., will tell how tin-base babbitts can be replaced by lead-base babbitts; E. R. Darby, director of research, Federal Mogul Corp., will talk about bronze bushings; and R. P. Koehring, metallurgist, Moraine Products Division, General Motors Corp., will name substitutes in powder metallurgy bearings.

Cadmium-base bearings are the field of C. F. Smart, metallurgist, Pontiac Motor Division, General Motors Corp.; the rapidly growing applications of silver bearings will be given by E. A. Ryder, consulting engineer, Pratt & Whitney Aircraft Division; and A. J. Langhammer, Amplex Division, Chrysler Corp., will discuss the use of iron-copper bearings.

Substitutes in the automotive industry and problems in aircraft bearings are other subjects to be covered in brief prepared talks preceding an open discussion and question period.

## Industrial Gas Day Planned

Thursday, Oct. 23 has been designated Industrial Gas Day at the National Metal Congress and Exposition.

A meeting of the Metal Treating and Melting Committee of the Industrial and Commercial Gas Section of the American Gas Association will be held on that day at 1:30 p.m. in Room 200 at Convention Hall.

Chairman of the meeting will be Robert C. LeMay, Connecticut Light & Power Co., Waterbury, Conn. Eugene D. Milner is secretary of the Industrial and Commercial Gas Section of the A.G.A.

## Prominent Men on Information Panel

M. A. Grossmann  
W. E. JominyH. J. French  
E. C. BainH. W. McQuaid  
M. J. R. MorrisDiscuss Conservation  
Of High Alloy Steels

Stellar names in the roster of steel technologists dot the program of the A.S.M. National Defense Group Meeting on the higher alloy steels of the oil quenching type.

Leader of the meeting is Marcus A. Grossmann, chief metallurgist, Chicago District, Carnegie-Illinois Steel Corp.—one-time A.S.M. Campbell Memorial lecturer, author of a best-selling book on "Principles of Heat Treatment" and of countless technical papers.

Summarizer for the meeting is another Campbell lecturer, Harry W. McQuaid, assistant chief metallurgist, Republic Steel Corp., who is also at present a consultant for OPM.

Also on the program (and again Campbell lecturers) are E. C. Bain, assistant to the vice-president, U.S. Steel Corp., a past president of the Society and author of "Functions of the Alloying Elements in Steel"; and Herbert J. French, manager, alloy steel and iron development, International Nickel Co., vice-president-elect of the A.S.M.

Hardenability expert Walter Jominy, research engineer, Chrysler Corp., will discuss his specialty, and M. J. R. Morris, chief metallurgical engineer, Republic Steel Corp., will tell about means of making fine-grained steels.

Standardization of steel specifications

will be discussed by C. L. Warwick, secretary of the American Society for Testing Materials, and now consultant, Government Conservation Board, Division of Purchases, OPM.

Other subjects covered include an outline of the principal alloying elements in steel, commonly used alloy steels that are scarce or unobtainable, suggestions about substitutes that will not run into other bottlenecks, comparison of the scarce metals and substitutes, and changes in mechanical design of a part to permit substitution.

This highly important meeting will be held on Tuesday, Oct. 21, at 2:30 p.m.

Copper Alloys in  
Defense Subject of  
Meeting on Tuesday

Representatives of Frankford Arsenal will take an active part in the A.S.M. National Defense Group Meeting on "Copper Alloys in Defense", to be held Tuesday, Oct. 21, at 8:00 p.m.

The Arsenal's Major Leslie S. Fletcher will act as summarizer for this meeting, while Lt. W. W. Culbertson will speak briefly on "Copper and Its Alloys in Munitions Parts".

Leader of the meeting is to be Harry P. Croft, assistant director of research, Cleveland Mill Division, Chase Brass & Copper Co.

With copper classified at present by the Office of Production Management as a "precious metal", an interesting subject to be discussed will be conservation of copper by use of temporary substitutes in diversified industries.

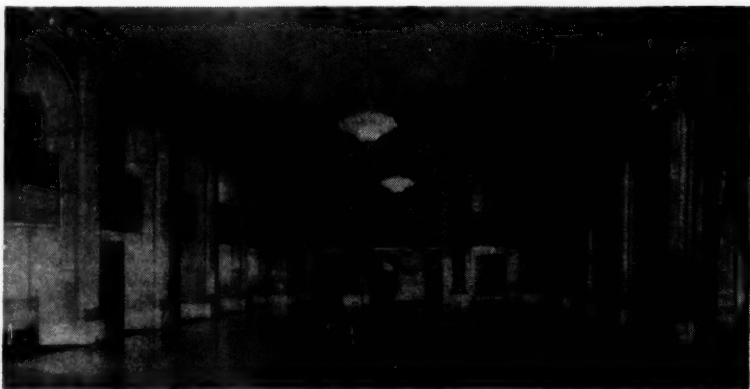
"Copper in Iron and Steel for Defense Work" will be treated by J. E. Jackson, metallurgical engineer, Copper Iron and Steel Development Association, and standardization of specifications by C. L. Warwick.

The intriguing title of "Increasing Production by Elimination of Unnecessary Alloys" has been assigned to D. K. Crampton, director of research, Chase Brass & Copper Co.



H. P. Croft

## Grand Ballroom, Benjamin Franklin Hotel



Morning Technical Sessions, The Annual Meeting and Annual Banquet of the A.S.M. Will Be Held in the Ballroom of the Benjamin Franklin Hotel.



# Technical Program of American Society for Metals

**Monday, Oct. 20**

**Morning**

9:00 a.m.—Ballroom, Benjamin Franklin Hotel

*Alloy Steels Session*

THE NICKEL-MOLYBDENUM SYSTEM, by F. H. Ellinger, General Electric Co.  
THE ACICULAR STRUCTURE IN NICKEL-MOLYBDENUM CAST IRONS, by R. A. Flinn, American Brake Shoe & Foundry Co., Morris Cohen and John Chipman, Massachusetts Institute of Technology.  
ELIMINATION OF THE APPARENT HOT BRITTLENESS OF 0.50 MOLYBDENUM STEEL, by C. L. Clark, Timken Roller Bearing Co., and J. W. Freeman, University of Michigan.  
SOME PROPERTIES OF PHOSPHORUS-TITANIUM STEELS, by G. F. Comstock, The Titanium Alloy Mfg. Co.  
WEAR TESTS ON FERROUS ALLOYS, by O. W. Ellis, Ontario Research Foundation.

9:00 a.m.—Washington Room, Benjamin Franklin Hotel

*Fabrication Session*

THE EFFECT OF MICROSTRUCTURE UPON THE WORK HARDENING CHARACTERISTICS OF A 0.74% CARBON STRIP STEEL, by N. P. Goss and Wm. Brenner, Jr., Cold Metal Process Co.  
PROBLEMS IN THE DRAWABILITY OF DEEP DRAWING SHEETS, by M. Asimow, Central Metal Products Co., and J. N. Crombie, Carnegie-Illinois Steel Corp.  
A STUDY OF CUTTING OILS WITH AND WITHOUT ADDED SULPHUR, by O. W. Boston and J. C. Zimmer, University of Michigan.  
SOME PROPERTIES OF SINTERED AND HOT PRESSED COPPER-ZINC POWDER COMPACTS, by C. G. Goetzel, American Electro Metal Corp.  
HOMOGENIZATION OF COPPER-NICKEL POWDER ALLOYS, by F. N. Rhines and R. A. Colton, Carnegie Institute of Technology.

9:00 a.m.—Betsy Ross Room, Benjamin Franklin Hotel

*Research Methods Session*

MAGNETIC METHODS FOR DETERMINING CARBON IN STEEL, by B. A. Rogers, Karl Wentzel and J. P. Riott, U. S. Bureau of Mines.  
APPLICATION OF OSCILLOGRAPH TO DETERMINATION OF COOLING RATES OF QUENCHED STEELS, by C. R. Austin, R. M. Allen and W. G. Van Note, Pennsylvania State College.  
THE INFLUENCE OF ALLOYING ELEMENTS ON THE CRITICAL POINTS OF STEELS AS MEASURED BY THE DILATOMETER, by R. N. Gillmor, General Electric Co.  
X-RAY STUDY OF THE  $A_2$  POINT OF PURE IRON USING THE GEIGER-MULLER COUNTER, by A. P. Wangsgard, University of Utah.  
HEAT ETCHING AS A GENERAL METHOD FOR REVEALING THE AUSTENITE GRAIN SIZE OF STEELS, by O. O. Miller and M. J. Day, United States Steel Corp.

11:30 a.m.—Ballroom, Benjamin Franklin Hotel

*Defense Meeting*

**Monday Afternoon**

2:30 p.m.—Ballroom, Convention Hall

*A. S. M. National Defense Group Meeting on Low Carbon Alloy Steels (Case Hardening Steels)*

LEADER: Gordon T. Williams, Metallurgist, Deere & Co.

SUMMARIZER: O. W. McMullan, Metallurgist, Youngstown Sheet & Tube Co.

REPORT from Conservation and Substitution Committee.

COMMONLY USED ALLOY STEELS THAT ARE SCARCE OR UNOBTAINABLE, by Walter Hildorf, Chief Metallurgical Engineer, Timken Steel & Tube Co.

SUGGESTIONS ABOUT SUBSTITUTES THAT WILL NOT RUN INTO OTHER BOTTLENECKS, by E. T. Barron, Manager, Metallurgical Division, Pittsburgh District, Carnegie-Illinois Steel Corp.

COMPARISON OF SCARCE STEELS AND SUBSTITUTES AS TO MACHINABILITY, SPEED OF CARBURIZATION, HARDNESS OF CASE, UNIFORM HARDENABILITY OF CASE, STRENGTH AND TOUGHNESS OF CORE, NATURE OF QUENCH, AMOUNT OF DISTORTION DURING HEAT TREATING, by F. E. McCleary, Metallurgical Engineer, Chrysler Corp.

**A.S.M. National Defense Group Meetings**

on

**Defense Problems, Conservation and Substitution**

Philadelphia Convention Hall

Oct. 20 to 24, 1941

**MONDAY, OCT. 20**

2:30 p.m.—Low Carbon Alloy Steels (Case Hardening Steels)

8:00 p.m.—Manufacture of Shells

8:00 p.m.—Aluminum and Magnesium in Defense

**TUESDAY, OCT. 21**

2:30 p.m.—Higher Alloy Steels (Oil Quenching Steels)

8:00 p.m.—Copper and Its Alloys

8:00 p.m.—Stainless and Heat Resisting Steel

**WEDNESDAY, OCT. 22**

2:30 p.m.—High Strength, Low Alloy Steels (Weldable Grades for Pressure Vessels, Piping, Ships, Rolling Stock)

8:00 p.m.—Inspection of Metals

**THURSDAY, OCT. 23**

2:30 p.m.—Alloy Castings (Steel and Iron)

2:30 p.m.—Bearing Metals

**FRIDAY, OCT. 24**

2:30 p.m.—Molybdenum High Speed Steels and Tool Steels

POSSIBILITIES OF FLAME HARDENING, INDUCTION HARDENING AND SALT BATH HARDENING OF SUBSTITUTE STEELS (Speaker to be announced).  
CHANGES IN MECHANICAL DESIGN OF A PART TO PERMIT SUBSTITUTES (Speaker to be announced).

5:00 p.m.—No. 300 Room, Convention Hall

*Educational Course*

HEAT FLOW IN METALS, by J. B. Austin, U. S. Steel Corp. Research Laboratories.

**Monday Evening**

8:00 p.m.—No. 300 Room, Convention Hall

*A.S.M. National Defense Group Meeting on Manufacture of Shells*

LEADER: Arthur F. Macconochie, Head, Department of Mechanical Engineering, University of Virginia.

SUMMARIZER: (To be announced).

SHELL STEEL (Speaker to be announced).

FORGED SHELLS, by F. G. Schranz, General Manager, Baldwin-Southwark Div.

HEAT TREATMENT OF SHELLS, by Col. H. H. Zornig, Office of Chief of Ordnance.

SAND BLASTING OF SHELLS (Speaker to be announced).

MACHINING OF SHELLS, by Ben C. Brosheer, Associate Editor, *American Machinist*.

CARTRIDGE CASES, by Alan Morris, Research Engineer, Bridgeport Brass Co.

8:00 p.m.—Ballroom, Convention Hall

*A.S.M. National Defense Group Meeting on Problems in the Fabrication of Aluminum Base Alloys and Magnesium Base Alloys for Defense Material*

LEADER: E. H. Dix, Jr., Chief Metallurgist, Aluminum Co. of America.

SUMMARIZER: Harry Huester, Metallurgist, Reynolds Metals Co.

ALUMINUM CASTINGS AND THEIR HEAT TREATMENT, by B. Clements, Metallurgist, Wright Aeronautical Corp.

ALUMINUM FORGINGS AND THEIR HEAT TREATMENT, by L. W. Davis, Chief Metallurgist, Forgings Division, Aluminum Co. of America.

ALUMINUM STRUCTURAL SHAPES AND SHEET, AND THEIR HEAT TREATMENT, by T. W. Bossert, Assistant Chief Metallurgist, Fabricating Division, Aluminum Co. of America.

WELDING OF ALUMINUM, by G. O. Hoglund, Welding Engineer, Aluminum Co. of America.

MACHINING OF ALUMINUM, by W. A. Dean, Research Metallurgist, Aluminum Co. of America.

MAGNESIUM CASTINGS, by Arthur W. Winston, Director, Metallurgical Department, Dow Chemical Co.

8:00 p.m.—No. 400 Room, Convention Hall

*Educational Course*

HARDNESS AND HARDNESS MEASUREMENTS, by S. R. Williams, Amherst College.

**Tuesday, Oct. 21**

**Morning**

9:00 a.m.—Washington Room, Benjamin Franklin Hotel

*Hardenability and Physical Properties Session*

HARDENABILITY TESTING OF LOW CARBON STEELS, by R. C. Frerichs and E. S. Rowland, Timken Roller Bearing Co.

HARDENABILITY OF SHALLOW-HARDENING STEELS, by C. B. Post, O. V. Greene and W. H. Fenstermacher, Carpenter Steel Co.

THE EFFECT OF CARBON CONTENT AND COOLING RATE ON THE DECOMPOSITION OF AUSTENITE DURING CONTINUOUS COOLING OF PLAIN CARBON STEELS, by R. F. Thomson and C. A. Siebert, University of Michigan.

THE TENSILE PROPERTIES OF PEARLITE, BAINITE AND SPHEROIDITE, by M. Gensamer, E. B. Pearsall, W. S. Pellini and J. R. Low, Jr., Carnegie Institute of Technology.

EFFECTS OF INITIAL STRUCTURE ON AUSTENITE GRAIN FORMATION AND COARSENING, by M. Baeyertz, Carnegie-Illinois Steel Corp.

9:00 a.m.—Ballroom, Benjamin Franklin Hotel

*Corrosion and Stainless Steels Session*

THE INFLUENCE OF STRESS ON THE CORROSION PITTING OF STEEL IN DISTILLED WATER, by D. J. McAdam, Jr., and G. W. Geil, National Bureau of Standards.

THE RATE OF FORMATION OF TIN-IRON ALLOY DURING HOT DIP TINNING AS MEASURED BY A MAGNETIC METHOD, by A. U. Seybolt, Battelle Memorial Institute.

THE ROLE OF NITROGEN IN 18-8 STAINLESS STEEL, by H. H. Uhlig, General Electric Co.

THE CYCLIC TEMPERATURE ACCELERATION OF STRAIN IN HEAT RESISTING ALLOYS, by G. R. Brophy and D. E. Furman, International Nickel Co.

BALANCING THE COMPOSITION OF CAST 25% CHROMIUM, 12% NICKEL TYPE ALLOYS, by J. T. Gow and O. E. Harder, Battelle Memorial Institute.

9:00 a.m.—Betsy Ross Room, Benjamin Franklin Hotel

*Heat Treatment*

UREA PROCESS FOR NITRIDING STEELS, by R. P. Dunn, Electro Manganese Corp., W. B. F. Mackay, Royal Canadian Air Force, and R. L. Dowdell, University of Minnesota.

THE KINETICS OF GRAPHITIZATION IN WHITE CAST IRON, by H. A. Schwartz, National Malleable and Steel Castings Co.

EFFECTS OF SMALL AMOUNTS OF ALLOYING ELEMENTS ON GRAPHITIZATION OF HIGH PURITY HYPER-EUTECTOID STEELS, by C. R. Austin, Pennsylvania State College, and B. S. Norris, United States Pipe and Foundry Co.

EFFECT OF COOLING TEMPERATURE AFTER CARBURIZING ON REHEATED AND SINGLE QUENCHED STEEL, by O. W. McMullan, Youngstown Sheet and Tube Co.

THE PRECIPITATION REACTION IN AGED COLD-ROLLED BRASSES: ITS EFFECTS ON HARDNESS, CONDUCTIVITY, AND TENSILE PROPERTIES, by R. H. Harrington and T. C. Jester, General Electric Co.

11:30 a.m.—Ballroom, Benjamin Franklin Hotel

*Defense Meeting*

12:00 noon—Franklin Room, Benjamin Franklin Hotel

*Canadian Luncheon*

(CONTINUED ON NEXT PAGE)

# Technical Program of American Society for Metals

(CONTINUED FROM PAGE 5)

## Tuesday Afternoon

2:30 p.m.—Ballroom, Convention Hall

**A.S.M. National Defense Group Meeting on Higher Alloy Steels (Oil Quenching Steels)**

**LEADER:** M. A. Grossmann, Chief Metallurgist, Chicago District, Carnegie-Illinois Steel Corp.

**SUMMARIZER:** Harry W. McQuaid, Consultant, OPM, and Assistant Chief Metallurgist, Republic Steel Corp.

**REPORT** from Conservation and Substitution Committee of OPM.

**OUTLINE OF FUNCTION OF PRINCIPAL ALLOYS IN STEEL**, by E. C. Bain, Assistant to the Vice-President, U. S. Steel Corp.

**COMMONLY USED ALLOY STEELS THAT ARE SCARCE OR UNOBTAINABLE** (Speaker to be announced).

**STANDARDIZATION OF STEEL SPECIFICATIONS**, by C. L. Warwick, Consultant, Government Conservation Board, Division of Purchases, OPM.

**SUGGESTIONS ABOUT SUBSTITUTES THAT WILL NOT RUN INTO OTHER BOTTLENECKS:** (a) MEANS OF MAKING FINE-GRAINED STEELS, by M. J. R. Morris, Chief Metallurgical Engineer, Republic Steel Corp.

**EVALUATING THE HARDENABILITY OF STEEL**, by Walter E. Jominy, Research Metallurgist, Chrysler Corp.

**COMPARISON OF SCARCE STEELS AND SUBSTITUTES AS TO AVAILABILITY AND COST, MACHINABILITY AT NORMAL AND HIGH HARDNESS LEVELS, PHYSICAL PROPERTIES OBTAINABLE, HEAT TREATING SCHEDULE AND QUENCHING EQUIPMENT, AND DISTORTION**, by H. J. French, Manager, Alloy Steel and Iron Development, International Nickel Co., Inc.

**CHANGES IN MECHANICAL DESIGN OF A PART TO PERMIT SUBSTITUTION** (Speaker to be announced).

5:00 p.m.—No. 300 Room, Convention Hall

## Educational Course

**HEAT FLOW IN METALS**, by J. B. Austin, U. S. Steel Corp. Research Laboratories.

## Tuesday Evening

8:00 p.m.—No. 300 Room, Convention Hall

**A.S.M. National Defense Group Meeting on Copper and Its Alloys**

**LEADER:** Harry P. Croft, Assistant Director of Research, Cleveland Mill Division, Chase Brass & Copper Co.

**SUMMARIZER:** Major Leslie S. Fletcher, Frankford Arsenal.

**INCREASING PRODUCTION BY ELIMINATION OF UNNECESSARY ALLOYS**, by D. K. Crampton, Director of Research, Chase Brass & Copper Co.

**STANDARDIZATION OF SPECIFICATIONS**, by C. L. Warwick, Consultant, Government Conservation Board, Division of Purchases, OPM.

**CONSERVATION OF COPPER BY USE OF TEMPORARY SUBSTITUTES:**

(a) **IN DIVERSIFIED INDUSTRY**, by W. B. Price, Chief Chemist and Metallurgist, Scovill Mfg. Co.

(b) **IN THE ELECTRICAL INDUSTRY**, by T. S. Fuller, Engineer of Materials, Schenectady Works Laboratory, General Electric Co.

(c) **IN COMMUNICATIONS INDUSTRY**, by Earle E. Schumacher, Bell Telephone Laboratories.

**USE OF COPPER ALLOYS AS ALTERNATES FOR SCARCE METALS**, by John R. Freeman, Manager, Technical Department, American Brass Co.

**COPPER AND ITS ALLOYS IN MUNITIONS PARTS**, by Lt. W. W. Culbertson, Frankford Arsenal.

**COPPER IN IRON AND STEEL FOR DEFENSE WORK**, by J. E. Jackson, Metallurgical Engineer, Copper Iron and Steel Development Association.

8:00 p.m.—Ballroom, Convention Hall

**A.S.M. National Defense Group Meeting on Stainless and Heat Resisting Steel**

**CO-CHAIRMAN (STEEL):** A. L. Feild, Director of Research, Rustless Iron and Steel Corp.

**CO-CHAIRMAN AND SUMMARIZER (CORROSION):** R. J. McKay, Chemical Engineer, International Nickel Co., Inc.

**REPORT** from Conservation and Substitution Committee.

## THE PROBLEM OF CONSERVATION: -

(a) **SUBSTITUTES FOR DECORATIVE USES**, by C. E. Heussner, Chrysler Corp.

(b) **USE OF ALLOYS OF LOWER CHROMIUM AND/OR NICKEL.**

16% CR, 1½% NI, by Stanley P. Watkins, Manager, Development Division, Rustless Iron and Steel Corp.

13% CR STEELS, by R. A. Lincoln, Assistant Director of Research, Allegheny Ludlum Steel Corp.

(c) **USE OF RECLAIMED SCRAP IN HIGHER CARBON ANALYSES**, by Hubert A. Grove, Metallurgist, Alloy Steel Division, Republic Steel Corp.

(d) **CLAD MATERIALS**, by S. L. Hoyt, Technical Advisor, Battelle Memorial Institute.

(e) **CONSERVATION OF AND SUBSTITUTION FOR HEAT RESISTING ALLOYS**, by M. A. Hunter, Technical Staff, Driver-Harris Co.

## THE PROBLEM OF SUBSTITUTION:

(a) **USES OF COPPER-SILICON AND OTHER COPPER ALLOYS**, by John R. Freeman, Manager, Technical Department, American Brass Co.

(b) **LEAD**, by R. L. Hallett, Chief Chemist, National Lead Co.

(c) **SILICON IRONS**, by D. E. Jack, General Sales Manager, Duriron Co., Inc.

(d) **CALORIZED IRONS**, by B. J. Sayles, The Calorizing Co.

(e) **SILICON CEMENTATION**, by Harry K. Ihrig, Director of Laboratories, Globe Steel Tubes Co.

(f) **MANGANESE, COPPER, ALUMINUM AND SILICON AS SUBSTITUTES FOR CHROMIUM AND NICKEL IN QUASI-STAINLESS STEELS**, by Russell Franks, Metallurgical Engineer, Union Carbide and Carbon Research Laboratories, Inc.

(g) **SILVER AND PLATINUM LINED EQUIPMENT**, by Fred E. Carter, Director of Research, Baker & Co.

8:00 p.m.—No. 400 Room, Convention Hall

## Educational Course

**HARDNESS AND HARDNESS MEASUREMENTS**, by S. R. Williams, Amherst College.

## Wednesday, Oct. 22

### Morning

7:30 a.m.—Franklin Room, Benjamin Franklin Hotel

### Chapter Chairmen's Breakfast

9:30 a.m.—Ballroom, Benjamin Franklin Hotel

### Annual Meeting of the American Society for Metals

1941 EDWARD DE MILLE CAMPBELL MEMORIAL LECTURE, by R. F. Mehl, Carnegie Institute of Technology.

12:00 noon—Benjamin Franklin Hotel

### Alumni Luncheons

## Philadelphia City Hall



## Afternoon

2:30 p.m.—Ballroom, Convention Hall

**A.S.M. National Defense Group Meeting on High Strength Low Alloy Steels (Weldable Grades for Pressure Vessels, Piping, Ships, Rolling Stock)**

**LEADER:** Col. Glenn F. Jenks, Ordnance Department, U. S. Army.

**SUMMARIZER:** James C. Hodge, Vice-President, Wellman Engineering Co.

(This discussion to confine itself to steels used as received from steel mills; the customer doing no heat treatment other than perhaps a stress relief.)

**REPORT** from Conservation and Substitution Committee.

**ALLOYS AVAILABLE TO GIVE STRENGTH WITHOUT HEAT TREATMENT**, by A. B. Kinzel, Chief Metallurgist, Union Carbide & Carbon Research Laboratories, Inc.

**LIMITS OF ALLOYING BEFORE WELDABILITY IS IMPAIRED**, by Leon C. Bibber, Welding Engineer, Carnegie-Illinois Steel Corp.

**SUBSTITUTES FOR SCARCE ALLOYS**, by B. D. Saklatwalla, Consultant, Alloys Development Corp.

**SUBSTITUTIONS IN VARIOUS INDUSTRIES:**

(a) **RAILROAD ROLLING STOCK**, by B. D. Saklatwalla, Consultant, Alloys Development Corp.

(b) **PRESSURE VESSELS, PIPING AND BOLTING**, by J. J. Kanter, Materials Research Engineer, Crane Co.

(c) **LARGE FORGINGS**, by F. B. Foley, Superintendent, Research Department, The Midvale Co.

(d) **SHIPS' HULLS**, by Paul D. Field, Materials Engineer, Bethlehem Steel Co., Shipbuilding Division.

(e) **BRIDGES AND BUILDING SKELETONS**, by Jonathan Jones, Chief Engineer, Bethlehem Steel Co.

**WELDED PIPE AND PRESSURE VESSEL LININGS**, by Merrill A. Scheil, Research Metallurgist, A. O. Smith Corp.

5:00 p.m.—No. 300 Room, Convention Hall

## Educational Course

**HEAT FLOW IN METALS**, by J. B. Austin, U. S. Steel Corp. Research Laboratories.

## Wednesday Evening

8:00 p.m.—Ballroom, Convention Hall

**A.S.M. National Defense Group Meeting on Inspection of Metals**

**LEADER:** John W. W. Sullivan, Head, Inspection Division, Cleveland Ordnance District.

**SUMMARIZER:** W. J. Jeffries, District Chief Engineer, Philadelphia Ordnance District.

**PRINCIPLES OF INSPECTION OF NON-FERROUS MATERIALS**, by Ernest E. Thum, Editor, METAL PROGRESS.

**PRINCIPLES OF INSPECTION OF FERROUS MATERIALS**, by Earl Blaine, Chief Inspector, E. G. Budd Mfg. Co.

**PRINCIPLES OF AIRCRAFT INSPECTION**, by C. G. Stephens, Materials Supervisor, Glenn L. Martin Co.

**INSPECTION OF AIRCRAFT ENGINE MATERIALS**, by E. S. Marks, Quality Engineer, Pratt & Whitney Aircraft Div.

**ARMY ORDNANCE INSPECTION**, by Brig. Gen. R. H. Somers, Ordnance Department, U. S. Army.

**NAVY ORDNANCE INSPECTION** (Speaker to be announced).

**MARINE CONSTRUCTION INSPECTION**, by Capt. Ralph T. Hanson, U.S.N., Supervisor of Shipbuilding, Cramp Shipbuilding Co.

**TRAINING OF INSPECTORS**, by Capt. K. J. Soderberg, Civilian Personnel Division, Office of Chief of Ordnance, U.S.A.

8:00 p.m.—No. 400 Room, Convention Hall

## Educational Course

**HARDNESS AND HARDNESS MEASUREMENTS**, by S. R. Williams, Amherst College.

## Thursday, Oct. 23

### Morning

9:00 a.m.—Ballroom, Benjamin Franklin Hotel

### Symposium on Controlled Atmospheres

**FUNDAMENTAL FEATURES OF CONTROLLED ATMOSPHERES, PARTICULARLY FOR THE HEAT TREATMENT OF STEEL**, by H. W. Gillett and B. W. Gonser, Battelle Memorial Institute.



# Technical Program of American Society for Metals

CHEMICAL EQUILIBRIUM AS A GUIDE IN THE CONTROL OF FURNACE ATMOSPHERES, by J. B. Austin and M. J. Day, United States Steel Corp.

PREVENTION OF OXIDATION TYPE OF REACTION OF FERROUS METALS, by A. G. Hotchkiss and H. M. Webber, General Electric Co.

PREVENTION OF OXIDATION TYPE OF REACTION IN THE HEAT TREATMENT OF COPPER AND ITS ALLOYS, by E. G. deCoriolis and William Lehrer, Surface Combustion Corp.

THE HEAT TREATMENT OF THE CHROMIUM-CARBON STAINLESS STEELS, by W. E. Mahin and W. C. Troy, Westinghouse Electric & Mfg. Co.

9:00 a.m.—Betsy Ross Room, Benjamin Franklin Hotel

## Physical Properties Session

THE EFFECT OF STRAIN RATE UPON THE TENSILE IMPACT STRENGTH OF SOME METALS, by E. R. Parker and C. Ferguson, General Electric Co.

EFFECT OF GRAIN SIZE AND HEAT TREATMENT UPON IMPACT TOUGHNESS AT LOW TEMPERATURES OF MEDIUM CARBON FORGING STEEL, by S. J. Rosenberg and D. H. Gagon, National Bureau of Standards.

LOW TEMPERATURE IMPACT RESISTANT STEEL CASTINGS, by N. A. Ziegler and H. W. Northrup, Crane Co.

DYNAMIC HARDNESS TESTING OF METALS AND ALLOYS AT ELEVATED TEMPERATURES, by Erich Fetz, C. O. Jelliff Mfg. Corp.

9:00 a.m.—Washington Room, Benjamin Franklin Hotel

## Metallography of Steel Session

MICROSTRUCTURAL CHARACTERISTICS OF HIGH PURITY ALLOYS OF IRON AND CARBON, by T. G. Digges, National Bureau of Standards.

THE STRUCTURE OF PEARLITE, by F. C. Hull, Westinghouse Electric & Mfg. Co., and R. F. Mehl, Carnegie Institute of Technology.

THE INTERLAMELLAR SPACING OF PEARLITE, by G. E. Pellissier, International Nickel Co., M. F. Hawkes, Carnegie Institute of Technology, W. A. Johnson, Westinghouse Electric & Mfg. Co., and R. F. Mehl, Carnegie Institute of Technology.

THE MARTENSITE THERMAL ARREST IN IRON-CARBON ALLOYS AND PLAIN CARBON STEELS, by A. B. Greninger, General Electric Co.

A STUDY OF MARTENSITE FORMATION BY A PHOTOMETRIC METHOD, by E. R. Saunders, Union Carbide & Carbon Corp., and J. F. Kahles, University of Cincinnati.

11:30 a.m.—Ballroom, Benjamin Franklin Hotel

## Defense Meeting

## Thursday Afternoon

2:30 p.m.—Ballroom, Convention Hall

A.S.M. National Defense Group Meeting on Alloy Castings (Steel and Iron)

CO-CHAIRMAN (IRON CASTINGS): A. L. Boegehold, Head, Metallurgical Department, Research Laboratories Division, General Motors Corp.

CO-CHAIRMAN AND SUMMARIZER (STEEL CASTINGS): C. H. Lorig, Battelle Memorial Institute.

REPORT from Conservation and Substitution Committee.

FUNCTION OF NICKEL, CHROMIUM AND VANADIUM THAT ARE SCARCE, by A. W. Demmler, Metallurgical Engineer, Vanadium Corp. of America.

FUNCTION OF MANGANESE THAT IS PROBABLY OBTAINABLE, by Fred Grotts, President, Fort Pitt Steel Castings Co.

FUNCTION OF MOLYBDENUM, COPPER, SILICON, TITANIUM, PHOSPHORUS THAT ARE MORE PLentiful (Speaker to be announced).

UTILIZATION OF CLASSIFIED SCRAP AND ALLOY PIG IRON, by Victor Crosby, Foundry Engineer, Climax Molybdenum Corp.

ULTIMATE CONSERVATION DUE TO OVER-ALL ECONOMIES OF STRONGER, MORE MACHINABLE AND MORE DURABLE METAL, by Victor Crosby, Foundry Engineer, Climax Molybdenum Corp.

SITUATION IN VARIOUS IMPORTANT INDUSTRIES:

(a) AUTOMOTIVE (Speaker to be announced).  
(b) RAILROAD, by Samuel Z. Krumm, Metallurgist, The Buckeye Steel Castings Co.

(c) POWER, by Norman L. Mochel, Metallurgical Engineer, Westinghouse Electric & Mfg. Co.

(d) CHEMICAL AND PETROLEUM, by Francis B. Foley, Superintendent, Research Department, The Midvale Co.

(e) MACHINE TOOLS, by Herman Ewig, Foundry Manager, Cincinnati Milling Machine Co.

(f) AGRICULTURAL MACHINERY, by Hyman Bornstein, Chief Metallurgist, Deere & Co.

2:30 p.m.—No. 400 Room, Convention Hall

A.S.M. National Defense Group Meeting on Bearings: Problems, Conservation and Substitution

LEADER: O. E. Harder, Assistant Director, Battelle Memorial Institute.

SUMMARIZER: A. Allan Bates, Manager, Chemical and Metallurgical Department, Westinghouse Electric & Mfg. Co.

REPORT from Conservation and Substitution Committee.

REPLACING TIN-BASE BABBITTS BY LEAD-BASE BABBITTS, by Carl E. Swartz, Metallurgist, Cleveland Graphite Bronze Co.

BRONZE BUSHINGS, by E. R. Darby, Director of Research, Federal Mogul Corp.

PROBLEMS AND SUBSTITUTES IN POWDER METALLURGY BEARINGS, by R. P. Koehring, Metallurgist, Moraine Products Division, General Motors Corp.

CADMIUM-BASE BEARINGS, by C. F. Smart, Metallurgist, Pontiac Motor Division, General Motors Corp.

SILVER BEARINGS, by E. A. Ryder, Consulting Engineer, Pratt & Whitney Aircraft Div.

BEARING SUBSTITUTES IN THE AUTOMOTIVE INDUSTRY, by Arthur F. Underwood, Head Mechanic, Research Laboratories Division, General Motors Corp.

PROBLEMS IN AIRCRAFT BEARINGS (Speaker to be announced).

THE USE OF IRON-COPPER BEARINGS, by A. J. Langhammer, Amplex Division, Chrysler Corp.

5:00 p.m.—No. 300 Room, Convention Hall

## Educational Course

HEAT FLOW IN METALS, by J. B. Austin, U. S. Steel Corp. Research Laboratories.

7:30 p.m.—Ballroom, Benjamin Franklin Hotel

Annual Banquet of the American Society for Metals

## Friday, Oct. 24

### Morning

9:00 a.m.—Ballroom, Benjamin Franklin Hotel

### Symposium on Controlled Atmospheres

ATMOSPHERIC CONTROL FOR THE PREVENTION OF DECARBURIZATION IN SPRINGS AND SIMILAR PRODUCTS, by J. A. Comstock, Pratt & Whitney Aircraft Div.

METHODS FOR DETERMINING THE DEGREE OF CARBURIZATION OR DECARBURIZATION AND EVALUATING CONTROLLED ATMOSPHERES, by N. K. Koebel, Lindberg Engineering Co.

SURFACE EFFECTS ACCOMPANYING THE HEATING OF CARBON TOOL STEEL IN OXIDIZING ATMOSPHERES, by R. D. Stout and Toivo Aho, Lehigh University.

DISCUSSION OF EQUIPMENT, INSTRUMENTATION AND ECONOMY, by E. E. Slowter, Battelle Memorial Institute.

ATMOSPHERIC CONTROL IN THE HEAT TREATMENT OF ALUMINUM PRODUCTS, by P. T. Stroup, Aluminum Co. of America.

ATMOSPHERIC CONTROL IN THE HEAT TREATMENT OF MAGNESIUM PRODUCTS, by C. E. Nelson, Dow Chemical Co.

9:00 a.m.—Washington Room, Benjamin Franklin Hotel

### High Speed Steels Session

ELECTRICAL RESISTANCE METHOD FOR THE DETERMINATION OF ISOTHERMAL AUSTENITE TRANSFORMATIONS, by F. B. Rote, International Nickel Co., W. C. Truckenmiller, A-C Spark Plug Div., General Motors Corp., and W. P. Wood, University of Michigan.

THE TEMPERING OF TWO HIGH CARBON, HIGH VANADIUM HIGH SPEED STEELS, by B. S. Lement and Morris Cohen, Mass. Inst. of Technology.

THE TRANSFORMATION OF RETAINED AUSTENITE IN HIGH SPEED STEEL AT SUB-ATMOSPHERIC TEMPERATURES, by M. P. Gordon and Morris Cohen, Massachusetts Institute of Technology.

STUDY OF DIMENSIONAL AND OTHER CHANGES IN VARIOUS DIE STEELS DUE TO HEAT TREATMENT, by G. M. Butler, Jr., Allegheny Ludlum Steel Corp.

HARDENING CHARACTERISTICS OF AN IRON-COBALT-TUNGSTEN ALLOY, by W. P. Sykes, General Electric Co.

9:00 a.m.—Betsy Ross Room, Benjamin Franklin Hotel

### Steel Making and Research Session

THE OVER-ALL LINEAR EXPANSION OF THREE FACE-CENTERED CUBIC METALS (AL, CU, PB) FROM -190° C. TO NEAR THEIR MELTING POINTS, by J. W. Richards, Mt. St. Mary's College.

THE TEMPERATURE AND MANNER OF GROWTH OF SHATTER CRACKS IN STEEL RAILS, by H. B. Wisheart and E. P. Epler, Carnegie-Illinois Steel Corp., and R. E. Cramer, University of Illinois.

THE CARBON-OXYGEN EQUILIBRIUM IN LIQUID IRON, by Shadburn Marshall, Remington Arms Co., and John Chipman, Mass. Inst. of Technology.

THE SOLUBILITY OF IRON OXIDE IN LIQUID IRON, by John Chipman, Massachusetts Institute of Technology, and K. L. Fetter, Carnegie Inst. of Tech.

RAPID TEMPERATURE MEASUREMENTS OF MOLTEN IRON AND STEEL WITH AN IMMERSION THERMOCOUPLE, by Fulton Holtby, University of Minnesota.

11:30 a.m.—Ballroom, Benjamin Franklin Hotel

### Defense Meeting

### Friday Afternoon

2:30 p.m.—Ballroom, Convention Hall

A.S.M. National Defense Group Meeting on Molybdenum High Speed Steels and Tool Steels

LEADER: Bradley Stoughton, Chief, Heat Treating Equipment Unit, Tools Section, OPM.

SUMMARIZER: G. V. Luerksen, Metallurgist, Carpenter Steel Co.

REPORT ON ALLOYING ELEMENTS from Conservation and Substitution Committee.

OPM COMMITTEE REPORT ON THE HEAT TREATMENT OF MOLYBDENUM HIGH SPEED STEEL:

(a) OPERATIONS, Norman I. Stotz, Metallurgist, Universal-Cyclops Steel Corp., Chairman.

(b) FURNACES AND CONTROLLED ATMOSPHERES, C. I. Hayes, President, C. I. Hayes, Inc., Chairman.

(c) SALT BATHS, A. F. Holden, President, A. F. Holden Co., Chairman.

TOOL STEELS, by James P. Gill, Chief Metallurgist, Vanadium-Alloys Steel Co.

2:30 p.m.—No. 300 Room, Convention Hall

### Educational Course

HEAT FLOW IN METALS, by J. B. Austin, U. S. Steel Corp. Research Laboratories.

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FOR AMERICA'S DEFENSE INSPECTORS  
A NEW LOW-PRICED GUIDE BOOK

## INSPECTION OF METALS

by Harry B. Pulsifer, Metallurgical Engineer, American Metal Treating Co., and Consulting Metallurgist, Ferry Cap and Set Screw Co., Cleveland, Ohio.

To help speed inspection of metals used in national defense, the American Society of Metals is making available at cost this new, authoritative 180-page book on metal inspection. Written in non-technical language by an authority in the field, "Inspection of Metals" is designed particularly for those with a limited knowledge of metal-making practice and the testing of metals.

Chapter One gives a brief review of what the steel maker aims to produce and how his best efforts may be frustrated by factors beyond his control. Remaining chapters enumerate various tests that can be made . . . the technique of making them . . . and how the results may be interpreted in terms of metal quality and utility. Many illustrations are used to clarify the particular details.

This low-priced book will be extremely helpful to defense inspectors and as a text-book in defense courses. Anyone interested in metal inspection will profit by purchasing it. Available immediately . . . order your copy today! 180 pages . . . 98 illustrations . . . 6" x 9" . . . Paper Cover, \$1.00 (postpaid) . . . Cloth Cover, \$1.50 (postpaid) . . . add 25c foreign postage. (No discount for quantity lots)

AMERICAN SOCIETY FOR METALS  
7301 Euclid Ave. ★ Cleveland, Ohio

# Institute of Metals, Iron & Steel Divisions, A. I. M. E.

Monday, October 20

9:00 a.m.—Palm Court, Ritz-Carlton Hotel  
Registration

10:00 a.m.—Ballroom, Ritz-Carlton Hotel  
Institute of Metals Division  
Copper and Tin Alloys

RATES OF HIGH TEMPERATURE OXIDATION OF DILUTE COPPER ALLOYS, by F. N. Rhines, Carnegie Institute of Technology, W. A. Johnson, Westinghouse Research Laboratories, and W. A. Anderson, Carnegie Institute of Technology.

EFFECT OF COLUMBIUM ON SOME ANNEALING CHARACTERISTICS OF COPPER AND 80-20 CUPRO-NICKEL, by A. U. Seybolt, Battelle Memorial Institute.

RECRYSTALLIZATION AND PRECIPITATION ON AGING OF TIN-BISMUTH ALLOYS, by J. E. Burke, Norton Co., and C. W. Mason, Cornell University.

THE FERROMAGNETIC NATURE OF THE BETA PHASE IN THE COPPER-MANGANESE-TIN SYSTEM, by L. A. Carapella, Naval Research Laboratory, and Ralph Hultgren, University of California.

10:30 a.m.—French Room, Ritz-Carlton Hotel  
Iron and Steel Division

Physical Chemistry of Steel Making

SILICON: OXYGEN EQUILIBRIA IN LIQUID IRON, by C. A. Zapffe and C. E. Sims, Battelle Memorial Institute.

SILICON MONOXIDE, by C. A. Zapffe and C. E. Sims, Battelle Memorial Institute.

12:15 p.m.—Supper Room No. 1, Ritz-Carlton Hotel  
Committee on Physical Chemistry of Steel Making  
Luncheon Meeting

2:00 p.m.—Ballroom, Ritz-Carlton Hotel  
Institute of Metals and Iron and Steel Divisions  
Joint Session on Physical Metallurgy

THEORY OF LATTICE EXPANSION INTRODUCED BY COLD WORK, by Clarence Zener, State College of Washington.

RAPID TENSION TESTS USING THE TWO-LOAD METHOD, by A. V. de Forest, C. W. MacGregor and A. R. Anderson, Massachusetts Institute of Technology.

A NEW METHOD FOR THE DETERMINATION OF STRESS DISTRIBUTION IN THIN-WALLED TUBING, by G. Sachs and G. Espey, Case School of Applied Science.

Tuesday, October 21

10:00 a.m.—Ballroom, Ritz-Carlton Hotel  
Institute of Metals Division

Session on Brass

EFFECT OF COLD WORK AND ANNEALING UPON INTERNAL FRICTION OF ALPHA BRASS, by Clarence Zener and Howard Clarke, State College of Washington, and Cyril Stanley Smith, American Brass Co.

STRENGTH DISTRIBUTION IN SUNK BRASS TUBING, by G. Sachs, G. Espey and G. B. Kasik, Case School of Applied Science.

RESIDUAL STRESS IN SUNK CARTRIDGE BRASS TUBING, by G. Sachs and G. Espey, Case School of Applied Science.

MICROGRAPHIC OBSERVATIONS OF SLIP LINES IN ALPHA BRASS, by R. G. Treuting and R. M. Brick, Yale University.

10:00 a.m.—French Room, Ritz-Carlton Hotel  
Iron and Steel Division  
Iron and Iron Alloys

A MAGNETIC DETERMINATION OF THE  $A_2$  TRANSFORMATION POINT IN IRON, by B. A. Rogers and K. O. Stamm, Bureau of Mines.

THE INSTABILITY OF LOW-EXPANSION IRON-NICKEL-COBALT ALLOYS, by Irvin R. Kramer and Francis M. Walters, Jr., Naval Research Laboratory.

ANALYSIS OF MECHANICAL PROPERTIES OF HEAT TREATED STEELS, by J. S. Marsh, Alloys of Iron Research.

THE EVALUATION OF DUCTILITY OF STEELS FOR WELDING, by A. B. Kinzel, Union Carbide & Carbon Research Laboratories.

12:15 p.m.—Supper Room No. 1, Ritz-Carlton Hotel  
Executive Committee, Institute of Metals Division  
Luncheon Meeting

12:15 p.m.—Supper Room No. 3, Ritz-Carlton Hotel  
Committee on Bessemer Steel  
Luncheon Meeting

## Philadelphia Skyline



2:00 p.m.—Ballroom, Ritz-Carlton Hotel  
Institute of Metals and Iron and Steel Divisions  
Joint Round Table Discussion

ORDER-DISORDER PHENOMENA, William B. Shockley, Bell Telephone Laboratories, Discussion Leader.

7:30 p.m.—Ballroom, Ritz-Carlton Hotel  
Institute of Metals and Iron and Steel Divisions  
Annual Autumn Dinner

Wednesday, October 22

12:15 p.m.—Supper Room No. 3, Ritz-Carlton Hotel  
Executive Committee, Iron and Steel Division  
Luncheon Meeting

2:00 p.m.—French Room, Ritz-Carlton Hotel  
Institute of Metals Division  
Magnesium and Aluminum Alloys

RELIEF OF RESIDUAL STRESS IN SOME ALUMINUM ALLOYS, by L. W. Kempf and K. R. Van Horn, Aluminum Co. of America.

PREFERRED ORIENTATION IN ROLLED MAGNESIUM AND MAGNESIUM ALLOYS, by P. W. Bakarian, Dow Chemical Co.

CORROSION STUDIES OF MAGNESIUM AND ITS ALLOYS, by J. D. Hanawalt, C. E. Nelson and J. A. Peloubet, Dow Chemical Co.

2:00 p.m.—Ballroom, Ritz-Carlton Hotel  
Iron and Steel Division  
Low Alloy Steel

MECHANICAL PROPERTIES OF IRON-MANGANESE ALLOYS, by F. M. Walters, Jr., I. R. Kramer and B. M. Loring, Naval Research Laboratory.

INFLUENCE OF CHROMIUM AND MOLYBDENUM ON STRUCTURE, HARDNESS AND DECARBURIZATION OF 0.35% CARBON STEEL, by R. F. Miller and R. F. Campbell, U. S. Steel Corp.

THE S-CURVE OF A CHROMIUM-NICKEL STEEL, by Blake M. Loring, Naval Research Laboratory.

# Program of the Wire Association at Metal Congress

Monday, October 20

2:30 p.m.—Hotel Philadelphia

OPENING ADDRESS, by F. A. Westphal, Sheffield Steel Corp., past president of the Wire Association.

THE CABLE INDUSTRY IN NATIONAL DEFENSE, by Kenneth S. Wyatt, Phelps Dodge Copper Products Corp.

WINGS OF THE ARMY—THE HISTORY AND ACTIVITIES OF THE U. S. ARMY AIR CORPS, Sound Motion Picture.

Tuesday, October 21

9:30 a.m.—Hotel Philadelphia

THE MORDICA MEMORIAL LECTURE, by Kenneth B. Lewis, Consulting Wire Mill Engineer.

STEEL FOR THE AGES, Sound Motion Picture by Allegheny Ludlum Steel Corp.

1:00 p.m.—Hotel Philadelphia

National Defense Luncheon

ADDRESSES by Brigadier General A. W. N. Schulz, A. A. Stockdale, National Association of Manufacturers, a representative of the War Department and of the Navy.

4:00 p.m.—Hotel Philadelphia

Annual Meeting of the Wire Association

Wednesday, October 22

9:45 a.m.—Hotel Philadelphia

THE EFFECTS OF MICROSTRUCTURE ON THE GALVANIZING CHARACTERISTICS OF STEEL, by R. W. Sandelin, Atlantic Steel Co.

HIGH SPEED ROTARY KNITTING MACHINE FOR COVERING ELECTRICAL CONDUCTORS, by S. E. Brillhart, Western Electric Co.

A BRIEF DISCUSSION OF THE MANUFACTURE OF STEEL FOR ARC WELDING ELECTRODES, by C. W. Garrett, Jones & Laughlin Steel Corp.

2:00 p.m.—Hotel Philadelphia

STAINLESS WIRE FOR THE AIRCRAFT INDUSTRY, by J. K. Findley, Allegheny Ludlum Steel Corp.

DIAMOND DIES FOR THE HIGH SPEED DRAWING OF COPPER WIRE, by H. N. Padowicz, Western Electric Co.

ELECTROLYTIC ZINC COATED WIRE, by L. H. Winkler, Bethlehem Steel Co.

7:30 p.m.—Hotel Philadelphia

Annual Dinner and Stag Smoker

Thursday, October 23

9:45 a.m.—Hotel Philadelphia

TIME, TEMPERATURE AND SIZE IN THE HEATING OF STEEL WIRE, by R. R. Tatnall, Wickwire Spencer Steel Co.

PRODUCTION OF COMMERCIAL BRONZE SCREEN CLOTH WIRE, by B. H. McGar, Chase Brass & Copper Co., Inc.

WINGS OF THE ARMY—THE HISTORY AND ACTIVITIES OF THE U. S. ARMY AIR CORPS, Sound Motion Picture.



## Educational Course on Hardness and Hardness Measurements to Be Presented

A series of three lectures on "Hardness and Hardness Measurements" to be presented during the National Metal Congress in Philadelphia will embody an attempt to clarify concepts of hardness and to improve the methods of measuring hardness, according to Samuel R. Williams, who will present the course.

These lectures will be given at 8:00 p.m. Monday, Tuesday and Wednesday, Oct. 20, 21 and 22. They will be held in Convention Hall and are open to anyone attending the Metal Congress.

The lecturer has been professor of physics at Amherst College since 1924. It was as a member of a special committee formed by the Engineering Division of the National Research Council toward the close of the World War

to study mechanical hardness that Professor Williams, a physicist, first became interested in what then seemed to be largely a metallurgical problem. He has continued his studies through the years, and has likewise done much research work on magnetic phenomena.

He was professor of physics at Oberlin College from 1908 to 1924 before coming to Amherst.

## Ways of Conserving And Substitutes for Stainless Considered

Defense problems in the field of stainless and heat resisting steels will be considered in two categories for the purposes of the National Defense Group Meeting to be held in Convention Hall on Tuesday, Oct. 21, at 8:00 p.m.

First will be the problem of conservation, which will include a discussion of substitutes for decorative uses, use of alloys of lower chromium and nickel, clad materials, and what can be done in the field of heat resisting alloys.

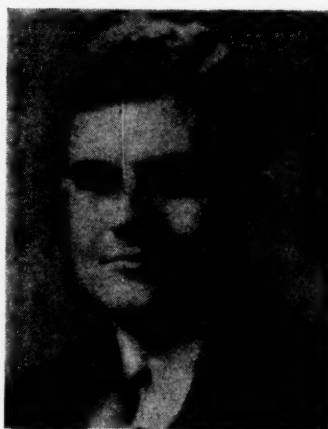
The problem of substitutes will consider uses of copper alloys, of lead, of silicon iron, calorized irons, silicon cementation, the quasi-stainless steels containing manganese, copper, aluminum and silicon as substitutes for chromium and nickel, and finally silver and platinum lined equipment.

Co-chairmen have been appointed for this meeting—namely, A. L. Feild, director of research, Rustless Iron & Steel Corp., who will lead the discussion when it applies to steels, and Robert J. McKay, chemical engineer, International Nickel Co., who will lead discussion on corrosion. Mr. McKay will also present the summary following the question period.

Other important names on this program include Stanley P. Watkins, manager, Development Division, Rustless Iron & Steel Corp.; S. L. Hoyt, technical advisor, Battelle Memorial Institute; Harry K. Ihrig, director of laboratories, Globe Steel Tubes Co.; and Russell Franks, metallurgical engineer, Union Carbide & Carbon Research Laboratories, Inc.

Frankford Arsenal; F. H. Pennell, De Laval Steam Turbine Co.; J. G. Jackson, William Steell Jackson & Son; and W. W. Barnes, Air Reduction Sales Co., who is representative of the American Welding Society on the committee.

## Gives Five Lectures



J. B. Austin

## Heat Flow in Metals Subject of Austin's Educational Course

"Heat Flow in Metals" is the subject of an educational course of five lectures to be presented during the National Metal Congress by J. B. Austin, physical chemist, United States Steel Corp. Research Laboratories.

Dr. Austin will present his lectures every afternoon at five o'clock on Monday, Tuesday, Wednesday and Thursday, with the final meeting on Friday at 2:30 p.m. They will be held in one of the meeting rooms at Convention Hall and Commercial Museum, where the National Metal Exposition will be going on.

Registrations may be made at Convention Hall on Monday, Oct. 20. Registration is made on presentation of A.S.M. membership cards. Members not wishing to attend all lectures may enroll for individual ones.

This course of five lectures will cover the nature of conduction in metals, factors influencing the thermal conductivity of metals and various applications of heat flow calculations. An attempt has been made to reduce the mathematics to an absolute minimum and the few equations which will be used are all quite simple.

The lectures will be illustrated by examples taken from the literature and from hitherto unpublished measurements which have been made available by several sources.

J. B. Austin was graduated from Lehigh University as a chemical engi-

## Boegehold and Lorig Handle Castings Forum

In a discussion meeting on alloy castings planned as a forum on the A.S.M. national defense program for the National Metal Congress, the alloying elements will be divided into those that are scarce, those that are probably obtainable, and those that are more plentiful. Three different experts will discuss these three classes of alloys.

Use of classified scrap and alloy pig iron, and conservation by means of stronger, more durable and more machinable metal will be briefly commented upon.

The program will then consider the situation in various important industries, namely, automotive, railroad, mining, power, chemical and petroleum, machine tools, and agricultural machinery.

Co-chairman for this meeting, which will be held on Thursday, Oct. 23, at 2:30 p.m., are A. L. Boegehold, head, metallurgical department, Research Laboratories Division, General Motors Corp., and C. H. Lorig, metallurgist, Battelle Memorial Institute.

These men will conduct the meeting, Mr. Boegehold leading the discussion and answering questions on iron castings, and Mr. Lorig handling the steel castings end.

A report from a representative of the Conservation and Substitution Committee will also be included in the proceedings.

neer in 1925, and received a Ph.D. from Yale in 1928. He joined the research laboratory of U. S. Steel Corp. in 1928, just as it was being started, and has been there ever since. He divides his time about equally between metals and refractories.

## Chapter Chairmen Will Get Together at Breakfast

Chairmen of A.S.M. Chapters will again be given an opportunity to exchange ideas and experiences at the Chapter Chairmen's Breakfast to be held in the Franklin Room of the Benjamin Franklin Hotel, at 7:30 a.m., on Wednesday, October 22 during the National Metal Congress.

The Board of Trustees will attend the breakfast and President Harder will preside. Otherwise attendance will be restricted to Chapter chairmen.

Topics of interest pertaining to the functioning of Chapters will be presented for open discussion.

## Engineers Club to Meet

All visiting engineers are invited to be present at a luncheon meeting of the Philadelphia Engineers Club to be held on Tuesday, Oct. 21.

The speaker will be Francis B. Foley, superintendent of research of the Midvale Co. The meeting will be held at Club headquarters at 1317 Spruce St.

## Committee Will Take Care Of Local Arrangements; Headquarters in Booth 215

The 1941 Convention Committee, named to take care of local arrangements for the National Metal Congress and Exposition, consists of prominent members of the Philadelphia Chapter of the Society.

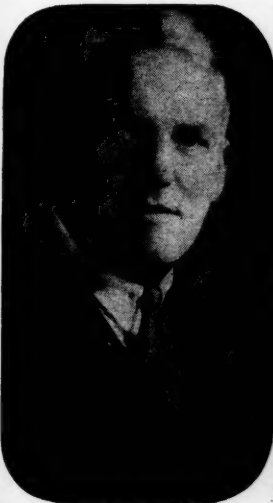
Extensive plans are being made by the committee to prepare booth 215, which the Chapter will occupy in conjunction with the national Society, so that it will offer a real service to all visiting members.

Members of the executive, exhibit and educational committees of the Chapter will constantly be in attendance and they wish all members and friends of the Society to feel free to use space 215 in the exhibit hall as headquarters and for meeting friends and leaving messages.

R. M. Bird and W. B. Coleman, both past presidents of the Society, are honorary chairmen, while John W. Harsch, Leeds & Northrup Co., chairman of the Philadelphia Chapter, is acting chairman.

Other members of the committee are Francis B. Foley, the Midvale Co., national treasurer-elect of the A.S.M.; F. G. Tatnall, Baldwin-Southwark Corp.; Major Leslie S. Fletcher of

## Prominent Philadelphians Serve on 1941 Convention Committee

R. M. Bird  
Honorary Chairman

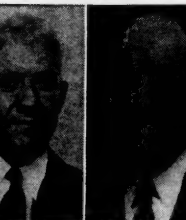
Francis B. Foley

John W. Harsch  
Chairman

L. S. Fletcher



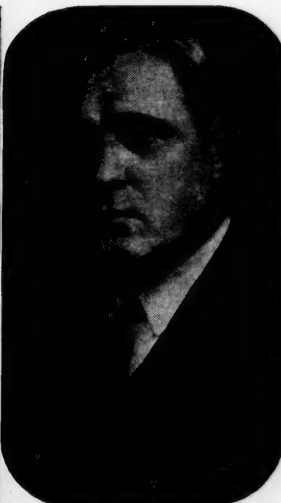
F. H. Pennell



F. G. Tatnall



W. W. Barnes

W. B. Coleman  
Honorary Chairman

J. G. Jackson

# Schedule of Events for American Welding Society

## Sunday, October 19

5:00 to 7:00 p.m.—North Garden, Bellevue-Stratford Hotel  
*President's Reception*

## Monday, October 20

9:30 a.m.—Rose Garden, Bellevue-Stratford Hotel  
*Opening Session; Presentation of Medals and Prizes*

10:15 a.m.—Rose Garden, Bellevue-Stratford Hotel  
*Session on Weldability of Plain Carbon and Low Alloy Steels*

THE SPECIFICATION OF WELDABILITY OF STEELS, by A. B. Kinzel, Union Carbide and Carbon Research Laboratories.

WELDABILITY TESTS OF NICKEL STEELS, by C. E. Jackson and G. G. Luther, Naval Research Laboratory.

WELDABILITY OF STEELS, by W. H. Bruckner, University of Illinois.

2:00 p.m.—Rose Garden, Bellevue-Stratford Hotel  
*Research Session—Non-Ferrous*

STUDY OF THE EFFECT OF CORE WIRE TEMPER ON THE QUALITY OF WELDS IN MONEL, NICKEL AND INCONEL, by F. G. Flocke and K. M. Spicer, The International Nickel Co., Inc.

THE FLOW OF METAL IN BRAZING ALUMINUM, by M. A. Miller, Aluminum Research Laboratories.

WELDING OF COPPER, by A. P. Young, Michigan College of Mining & Technology.

THE SPOT WELDING OF NICKEL, MONEL AND INCONEL, by W. F. Hess and Albert Muller, Rensselaer Polytechnic Institute.

2:00 p.m.—South Garden, Bellevue-Stratford Hotel  
*Shipbuilding Session*

RIVETED VS. WELDED GALVANIZED AND CORROSION RESISTING STEEL SMOKE PIPES, by H. O. Klinke, U. S. Navy Yard.

MACHINE FLAME CUTTING IN SHIPBUILDING, by E. R. McClung and H. L. Wagener, New York Shipbuilding Corp.

SURVEY OF WELDING AND CUTTING IN SHIP CONSTRUCTION, by F. G. Outcalt and J. M. Keir, The Linde Air Products Co.

WELDING APPLICATIONS IN NAVAL MACHINERY, by H. W. Hiemke and J. D. Bert, Navy Department, Bureau of Ships.

2:00 p.m.—North Garden, Bellevue-Stratford Hotel  
*Training Session*

TRAINING OF WELDING OPERATORS, Round-table discussion led by A. G. Bissell, Bureau of Ships, Navy Department.

A.W.S. MINIMUM REQUIREMENTS FOR THE TRAINING OF WELDING OPERATORS, by L. M. Dalcher, Secretary of Committee.

TRAINING WELDERS FOR NATIONAL DEFENSE, by James A. Waln, Defense Training Program, U. S. Office of Education.

TRAINING OF OXY-ACETYLENE WELDING AND CUTTING OPERATORS, by D. E. Roberts, International Acetylene Association.

7:30 p.m.—Bellevue-Stratford Hotel  
*Industrial Research Conference*

9:00 p.m.—Bellevue-Stratford Hotel  
*Educational Conference*

## Tuesday, October 21

9:30 a.m.—South Garden, Bellevue-Stratford Hotel  
*Fundamental Research Session—Arc Studies and Heat Flow*

MAGNETIC ARC BLOW, by C. H. Jennings and A. B. White, Westinghouse Electric & Mfg. Co.

METAL TRANSFER IN THE METALLIC ARC, by L. J. Larson, Consulting Engineer.

HEAT FLOW IN ARC WELDING, by E. M. Mahla, M. C. Rowland, C. A. Shook, and G. E. Doan, Lehigh University.

9:30 a.m.—Rose Garden, Bellevue-Stratford Hotel  
*Railroad Session*

WELDING AS APPLIED TO LOCOMOTIVES, by James Partington, American Locomotive Co.

DESIGN OF THE WORLD'S LARGEST WELDED FLAT CAR, by H. M. Priest, Railroad Research Bureau, U. S. Steel Corp. Subsidiaries.

WELDING LOCOMOTIVES, by A. J. Raymo, Baldwin Locomotive Co.

PRESSURE BUTT WELDING OF RAILROAD RAILS, by Lem Adams, Oxneld Railroad Service Co.

2:00 p.m.—North Garden, Bellevue-Stratford Hotel  
*Fundamental Research Session—Testing Methods*

PHOTOGRAPHY OF FUSION WELDS, by W. T. Tiffin, University of Oklahoma.

EVALUATING WELDED JOINTS, by W. F. Hess, Rensselaer Polytechnic Institute.

METHODS OF TESTING SPOT WELDS, by R. E. Bowman, War Dept., Air Corps.

THERMAL GRADIENTS IN SPOT-WELDING ELECTRODES, by F. R. Hensel, E. I. Larsen and E. F. Holt, P. R. Mallory & Co.

2:00 p.m.—Rose Garden, Bellevue-Stratford Hotel  
*Aircraft and Automotive Session*

AUTOMOTIVE WELDING, by S. M. Spice, Buick Motor Division, Vaughn Fegley, A-C Spark Plug Co., and L. M. Skidmore, General Motors Institute of Technology.

PRODUCTION AND QUALITY CONTROL IN ALUMINUM ALLOY SPOT WELDING, by P. H. Merriman, The Glenn L. Martin Co.

WELDING IN THE AIRCRAFT INDUSTRY, by F. M. Smith, Stout Skycraft Corp.

CONDENSER DISCHARGE WELDING OF ALUMINUM ALLOYS, by John W. Dawson, Raytheon Mfg. Co., and B. L. Wise, Federal Machine & Welder Co.

2:00 p.m.—South Garden, Bellevue-Stratford Hotel  
*Structural Session*

STRUCTURAL WELDING, by Van Rensselaer P. Saxe, Consulting Engineer.

DESIGN OF A WELDED BRIDGE, by G. T. Horton, Chicago Bridge & Iron Co.

ADAPTING DESIGN AND CONSTRUCTION METHODS TO WELDING, by LaMotte Grover, Air Reduction Sales Co.

CLEVELAND LIQUEFIED GAS STORAGE TANKS, by J. O. Jackson, Pittsburgh-DeMoines Steel Co.

BRIDGE WELDING, by T. H. Gardner, Florida East Coast Railway.

7:30 p.m.—Bellevue-Stratford Hotel  
*Fundamental Research Conference*

## Wednesday, October 22

9:30 a.m.—South Garden, Bellevue-Stratford Hotel  
*Research Session—Structural*

TESTS OF MISCELLANEOUS WELDED BUILDING CONNECTIONS, by Bruce Johnston and G. R. Deits, Lehigh University.

AN INVESTIGATION OF WELDED CONNECTIONS FOR AXIALLY LOADED ANGLE MEMBERS, by G. J. Gibson and B. T. Wake, American Bridge Co.

9:30 a.m.—Rose Garden, Bellevue-Stratford Hotel  
*Automotive and Aircraft Session*

WELDING IN AIRCRAFT CONSTRUCTION AND MAINTENANCE, by A. K. Seemann, The Linde Air Products Co.

MANAGEMENT CONTROL OF AIRCRAFT DESIGN AND WELDING, by J. P. Dods, Summerill Tubing Co.

A SURVEY OF AIRCRAFT RESISTANCE WELDING EQUIPMENT, by L. P. Wood, Curtiss-Wright Corp., Airplane Division.

2:00 p.m.—South Garden, Bellevue-Stratford Hotel  
*Resistance Welding Symposium*

STRUCTURAL AND METALLURGICAL PROPERTIES OF THE CONDENSOR DISCHARGE SPOT WELDS, by G. S. Mikhailapov and T. F. Falls, Taylor Winfield Corp.

PULSATION WELDING OF HEAVY STRUCTURES, by O. C. Frederick and R. P. McCants, General Electric Co.

THE ELECTRICAL CHARACTERISTICS OF RESISTANCE WELDERS AND PROXIMITY EFFECT OF MAGNETIC WORK MATERIALS, by J. H. Cooper, Taylor Winfield Corp.

POWER CONTROL, by H. R. Crago, General Electric Co.

FORGING WELDING, by L. M. Benkert, Progressive Welder Co.

SPOT WELDING CONTROL AND SUPERVISION, by J. R. Fetcher, E. G. Budd Mfg. Co.

2:00 p.m.—North Garden, Bellevue-Stratford Hotel  
*Fundamental Research Session—Metallurgical*

THE EFFECT OF PLATE TEMPERATURE AND VARIABLE WIND VELOCITIES ON PROPERTIES OF CARBON STEEL METAL ARC WELDS, by John L. Miller, Firestone Tire & Rubber Co., and E. L. Koehler, Illinois Institute of Technology.

WELDING ALUMINUM-CONTAINING STEELS, by C. E. Sims and F. B. Dahle, Battelle Memorial Institute.

NOTCH SENSITIVITY OF WELDS UNDER REPEATED LOADING, by H. L. Daasch, University of Vermont.

THE TEE BEND TEST AS A METHOD OF DETERMINING WELDABILITY OF STEEL, by G. A. Ellinger, Bureau of Standards, A. G. Bissell, Bureau of Ships, Navy Dept., and M. L. Williams, Bureau of Standards.

2:00 p.m.—Rose Garden, Bellevue-Stratford Hotel  
*National Defense Session*

TRAINING BRAZING INSTRUCTORS FOR DEFENSE, by Leo Edelson, Handy & Harman.

BILLET CUTTING FOR STEEL FORGINGS, by H. E. Rockefeller, The Linde Air Products Co.

MACHINE CUTTING IN NATIONAL DEFENSE WORK, by R. F. Helmkamp and A. H. Yoch, Air Reduction Sales Co.

SOME RADIOGRAPHIC ASPECTS OF ALUMINUM SPOT WELDS, by Robert C. Woods and S. L. Rich, Bell Aircraft Corp.

## Thursday, October 23

9:30 a.m.—South Garden, Bellevue-Stratford Hotel  
*Resistance Welding Session*

SURFACE POLISH AND CONTACT RESISTANCE, by W. B. Kouwenhoven and J. Tampico, Johns Hopkins University.

STRUCTURAL SPOT WELDING CONSISTENCY CONTROL METHODS, by A. M. Unger, Pullman-Standard Car Mfg. Co.

ELECTRICAL MEASUREMENT OF ELECTRODE PRESSURE DURING SPOT WELDING, by W. F. Hess and L. Daniel Runkle, Rensselaer Polytechnic Institute.

9:30 a.m.—Rose Garden, Bellevue-Stratford Hotel  
*Machinery Session*

FLAME HARDENING INTERNAL AND EXTERNAL ROUND SURFACES, by Stephen Smith, Air Reduction Sales Co.

USES OF FLAME HARDENING IN MACHINE TOOL PRODUCTION, by A. L. Hartley, R. K. LeBlond Machine Tool Co.

WELDING FROM STEEL FOUNDRYMAN'S POINT OF VIEW, by J. J. Curran and T. H. Booth, Walworth Co.

2:00 p.m.—Bellevue-Stratford Hotel  
*Committee Meetings and District and Section Officers Conference*

7:00 p.m.—Bellevue-Stratford Hotel  
*Annual Banquet of the American Welding Society*

## Friday, October 24

9:30 a.m.—South Garden, Bellevue-Stratford Hotel  
*Piping and Pressure Vessels Session*

FLAME PREHEATING AND STRESS-RELIEVING ARC WELDED HIGH PRESSURE PIPE LINES, by P. T. Onderdonk and Werner Peterson, Consolidated Edison Co. of New York.

WELDING PRESSURE VESSELS, TANKS AND HEAT EXCHANGERS, by H. B. Schlosser, Edge Moor Iron Works.

RADIOGRAPHIC EXAMINATION OF HEAVY PLATE, by O. R. Carpenter, Babcock & Wilcox Co.

9:30 a.m.—Rose Garden, Bellevue-Stratford Hotel  
*Session on Welding of High Alloy Steels*

HARDNESS MEASUREMENTS ON ROLLING STEEL THAT CONTAINED WELDS, by J. T. Phillips, Foster Wheeler Co.

THE SHOTWELD PROCESS OF WELDING 18-8 STAINLESS STEEL, by Joseph Winlock and J. J. MacKinney, E. G. Budd Mfg. Co.

11:30 a.m.—Bellevue-Stratford Hotel  
*Business Meeting and Board of Directors' Luncheon Meeting*



## Program for Visiting Ladies Is Arranged

Rich in historical buildings and relics, Philadelphia is one of the most interesting cities in the country to visitors and sightseers. A fine program of entertainment has therefore been arranged for the ladies who will attend the National Metal Congress.

Headquarters for the ladies will be in the Lafayette Room of the Benjamin Franklin Hotel for the A.S.M., in the Ritz-Carlton Hotel for the American Institute of Mining and Metallurgical Engineers, the Bellevue-Stratford for the American Welding Society, and the Philadelphia for the Wire Association.

A registration fee of \$4.00 will be charged to cover a portion of the expense involved in scheduling these events. The program is as follows:

### Monday, Oct. 20

9:00 a.m.—Registration.

12:30 p.m.—Luncheon, Terrace Room, Benjamin Franklin Hotel.

2:00 p.m.—Sightseeing tour covering historical, business, and residential sections (with stop at Independence Hall to see the Liberty Bell, Declaration Chamber, and historical relics).

### Tuesday, Oct. 21

1:00 p.m.—Luncheon at John Wanamaker's.

2:30 p.m.—John Wanamaker's famous fashion show (special section reserved for ladies of the Congress).

### Wednesday, Oct. 22

11:00 a.m.—Leave for Concord Country Club for luncheon. Then continue journey to du Pont Longwood Gardens, where special arrangements have been made for display of the fountain and organ recital.

### Thursday, Oct. 23

11:00 a.m.—Luncheon at beautiful Philadelphia Country Club, and visit to Valley Forge through St. Charles Seminary, Wynnewood, Ardmore, Haverford, passing Haverford College and School, Bryn Mawr, Rosemont, St. Davids, Wayne, Stratford and Devon. Stops will be made at Washington's headquarters, Washington Memorial Chapel, and other points of historical interest.

### Friday, Oct. 24

No activities have been planned for Friday, but for those who wish arrangements will be made to visit the

## Meeting on Aluminum and Magnesium Alloys Will Stress Fabrication Problems

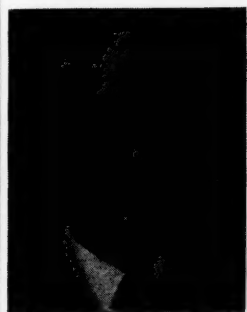
Aluminum and Magnesium, two particularly important defense metals, will come in for their share of attention during the National Metal Congress at a National Defense Group Meeting to be held in Convention Hall on Monday, Oct. 20, at 8:00 p.m.

Specifically, the meeting will cover problems in the fabrication of aluminum-base alloys and magnesium-base alloys for defense material.

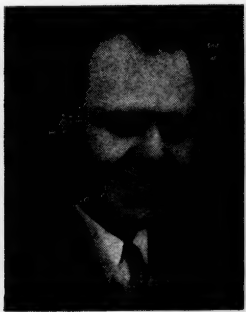
Aluminum castings, forgings and structural shapes and their heat treatment will be briefly discussed by various experts in these fields, as well as welding and machining of aluminum.

The subject of magnesium castings

## On the Defense Program for Tool Steels



Bradley Stoughton



James P. Gill



G. V. Luerssen

## OPM Committee Heads Report on Moly Hi Speed

No group of national defense meetings would be complete without a program devoted to the molybdenum high speed steels and tool steels, and this important subject will be treated in a meeting scheduled by the A.S.M. for Friday, Oct. 24 at 2:30 p.m.

A.S.M. President-Elect Bradley Stoughton, who is chief, Heat Treating Equipment Unit, Tools Section, Office of Production Management, will act as the discussion leader, and chairmen of three OPM committees on molybdenum high speed steels will give brief talks.

They are Norman I. Stotz, metallurgist, Universal-Cyclops Steel Corp., who will tell about the results of his work on the committee for the heat treatment of molybdenum high speed steel; C. I. Hayes, president, C. I. Hayes, Inc., who will discuss furnaces and con-

Franklin Institute to attend the showing (promptly at 3:00 p.m.) in the Planetarium on "How the Earth Moves". Buses will leave the hotel at 2:30 p.m.

A committee consisting of the wives of Philadelphia Chapter members is in charge of this program of ladies' entertainment. They are:

Mrs. R. M. Bird and Mrs. W. B. Coleman, co-chairmen, Mrs. William J. de Mauriac, Mrs. L. E. Ekholm, Mrs. L. S. Fletcher, Mrs. F. B. Foley, Mrs. John W. Harsch, Mrs. Joseph G. Jackson, Mrs. Franklin H. Pennell, Mrs. Adolph O. Schaefer, Mrs. Francis G. Tatnall, Mrs. W. Elmer Titus, and Mrs. T. M. Jackson, who represents the American Welding Society on the committee.

## Metal Treating Institute Meets

The annual meeting of the Metal Treating Institute will be held at the Benjamin Franklin Hotel in Philadelphia on Sunday, Oct. 19, just preceding the opening of the National Metal Congress. There will be a dinner celebration in the evening.

Charles Wesley, secretary, Wesley Steel Treating Co., Milwaukee, is president of the Institute.

## Metal Shortages in Railroad Cars, Ships, Bridges & Buildings Will Be Discussed

Railroad rolling stock, pressure vessels, piping and bolting, ships' hulls, bridges and building skeletons are a few of the items that will be considered in the National Defense Group Meeting on the high strength low alloy steels.

This meeting, which is scheduled for Wednesday, Oct. 22 at 2:30 p.m., is under the leadership of Col. Glenn F. Jenks of the Ordnance Department.

The discussion will confine itself to steels used as received from steel mills, the customer doing no heat treatment other than perhaps a stress relief.

The program will include a report from a representative of the Conservation and Substitution Committee and a talk by A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories, on alloys available to give strength without heat treatment.

Limits of alloying before weldability is impaired will be discussed by Leon C. Bibber, welding engineer, Carnegie-Illinois Steel Corp., and B. D. Saklatwalla, consultant, Alloys Development Corp., will talk about the substitutes for the scarce alloys, as well as substitutes in railroad rolling stock.

J. J. Kanter, materials research engineer, Crane Co., will tackle the problems in the pressure vessel and piping industry, and F. B. Foley superintendent, research department, Midvale Co., will tell what substitutes can be made in large forgings.

Paul D. Field, materials engineer, Shipbuilding Division, Bethlehem Steel Co., will talk about ships' hulls, Jonathan Jones, Bethlehem chief engineer, about bridges and building skeletons, and Merrill A. Scheil, research metallurgist, A. O. Smith Corp., will have a final word about welded pipe and pressure vessel linings.

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This 275-page book covers alloys in commercial steels — why alloy steels are used — selection of alloy steels — typical commercial uses — commercial steels and manufacturing variables — high alloy steels — wear — how alloying elements may affect corrosion of steels — processing and special treatments.

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# List of Firms Exhibiting at National Metal Exposition

**Abrasive Co.,** Booth G-39. Grinding wheels and abrasive materials.

**Acme Electric Welder Co.,** Booth A-6. Spot, projection, butt, flash and seam welders.

**Acme Industrial Co.,** Booth H-51. (See Charles R. Yerger Co.)

**Adirondack Foundries and Steel Co.,** Booth 298. Castings.

**Advance Polishing Wheels, Inc.,** Booth G-34. Polishing and buffing wheels.

**Agfa Ansco Corp.,** Booth C-56.

**Ajax Electric Co., Inc.,** Booth 211. Salt bath furnaces.

**Ajax Electrothermic Corp.,** Booth 211. High frequency furnaces, induction method for heating.

**Allen Mfg. Co.,** Booth B-39. Screws.

**Allis-Chalmers Mfg. Co.,** Booth 86. Arc welders, pumps, motors and drives.

**Alox Corp.,** Booth 62. Anti-corrosion products and corrosion preventives, lubricating materials.

**Aluminum Co. of America,** Booth 52. Aluminum products and aluminum alloys.

**Aluminum Ore Co.,** Booth 52. Aluminum ore.

**Alvey Ferguson Co.,** Booth C-54. Conveying machinery.

**American Allsafe Co.,** Booth A-28. Safety devices and clothing.

**American Brake Shoe & Foundry Co.,** Booth D-23. (See American Manganese Steel Div.)

**American Brass Co.,** Booth 278. Copper alloy welding rods, copper and brass products, flexible metal hose and tubing.

**American Bridge Co.,** Stage. (See United States Steel Corp.)

**American Car & Foundry Co.,** Booth 270. Electric bar heaters, forging heaters, rivet heaters.

**American Chain & Cable Co.,** Booth A-27. Nibbling machines, die sets, welding wire.

**American Foundry Equipment Co.,** Booth D-61. Blast cleaning equipment.

**American Gas Association,** Industrial Gas Exhibit. Gas heat treating and melting equipment.

**American Gas Furnace Co.,** Booth C. Gas heat treating furnaces and burners.

**American Gasifier Co.,** Booth F-54. Complete heat treating unit.

**American Institute of Mining and Metallurgical Engineers,** Booth 293. Educational exhibit.

**American Machine & Metals, Inc.,** Riehle Testing Machine Div., Booth D-29. Testing machines.

**American Machinist,** Booth 3. Publications.

**American Magnesium Corp.,** Booth 52. Magnesium alloys.

**American Manganese Steel Div., American Brake Shoe & Foundry Co.,** Booth D-23. Boxes, pots, and other small furnace castings.

**American Metal Market,** Booth A-19. Publications.

**American Rolling Mill Co.,** Booth F-31. Iron and steel sheets; specialty steels.

**American Society for Metals,** Booth 215. Educational exhibit.

**American Steel Castings Co.,** Booth 298. Steel castings.

**American Steel & Wire Co.,** Stage. Wire and rods, stainless and cold finished strip.

**American Welding Society,** Booth H-43. Educational exhibit.

**Ampco Metal, Inc.,** Booth F-50. High strength non-ferrous alloys for dies, bushings, wear strips, etc., aluminum and special bronzes.

**Andresen, Inc.,** Booth B-37. Publications.

**Arcos Corp.,** Booth 12. Welding rods and accessories.

## Crowds Watch Demonstrations at Expo



*Typical of the Thousands of Interested Metal Men Who Annually Attend the National Metal Exposition Is This Group of Spectators Watching One of the Operating Exhibits in Last Year's Show.*

**Armstrong Cork Co.,** Booth D-35. Insulating materials.

**Atlantic Steel Castings Co.,** Booth 298. Steel castings.

**Audubon Wire Cloth Corp.,** Booth D-21. Mesh screens, conveyor fabric, wire cloth.

**Automatic Temperature Control Co., Inc.,** Booth 31. Temperature control equipment.

**Automotive Industries,** Booth A-54. Publications.

**Babcock & Wilcox Co.,** Booth 27. Refractories.

**Baker & Co., Inc.,** Booth G-43. Precious metals, dental alloys.

**Baldwin Locomotive Works,** Booth E-6. Locomotives.

**Baldwin-Southwark Div.,** Booth E-6. Testing machines.

**Barrett-Cravens Co.,** Booth G-47. Industrial trucks.

**Bausch & Lomb Optical Co.,** Booth F-46. Optical instruments for metallography and spectrography.

**Beals, McCarthy & Rogers, Inc.,** Booth 250. (See Horace T. Potts Co.)

**Bennett Insured Steel Treating Co.,** Booth B-54. Steel heat treating.

**Bethlehem Steel Co.,** Booth D-6. Carbon and alloy steels, tool steels, strip, wire, etc.

**Birdsboro Steel Foundry & Machine Co.,** Booth 298. Steel and iron castings; dies, rolls, presses, machinery.

**Black & Decker Mfg. Co.,** Booth 44. Portable electric tools.

**Black Drill Co.,** Booth B-29. Drills.

**Blast Furnace & Steel Plant,** Booth B-33. Publications.

**Botfield Refractories Co.,** Booth A-16. Refractories.

**Bradley Washfountain Co.,** Booth B-22. Washfountains and showers.

**Bridgeport Brass Co.,** Booth H-38. Brass and copper mill products.

**Bristol Co.,** Booth 66. Pyrometers, temperature control equipment.

**Brown Instrument Co.,** Booth 63. Indicating, recording and automatic control instruments.

**Brown-Wales Co.,** Booth 250. (See Horace T. Potts Co.)

**Bruning Co., Inc.,** Charles, Booth A-22. Blueprint papers, drafting and surveying supplies, reproduction processes.

**Brush Development Co.,** Booth 26. Device for measuring surface smoothness.

**Bryant Heater Co.,** Booth Q. Furnaces, unit heaters, air conditioners.

**Budd Induction Heating, Inc.,** Booth F-22. Induction heat treating equipment.

**Buehler, A. I.,** Booth 30. Metallographic and laboratory equipment.

**Burkay Co.,** Booth P.

**Butterworth & Sons, H. W.,** Booth H-47. Castings.

**Callite Tungsten Corp.,** Booth G-54. Wire and wire products of tungsten, molybdenum and non-ferrous alloys.

**Cambridge Wire Cloth Co.,** Booth C-17. Conveyor belts, mesh baskets, heat and corrosion resistant screen.

**Campbell Div., Andrew C., American Chain & Cable Co., Inc.,** Booth A-27. Cut-off machines.

**Canadian Radium & Uranium Corp.,** Booth C-28. Radiographic equipment.

**Carboloy Co., Inc.,** Booth E-34. Cemented carbide tools.

**Carborundum Co.,** Booth 236. Abrasive materials, refractories.

**Carnegie-Illinois Steel Corp.,** Stage. Carbon and alloy steels, stainless and high tensile steels.

**Carpenter Steel Co.,** Booth 254. Tool steel and stainless steel.

**Central Screw Co.,** Booth 220. Screws, bolts, nuts, rivets.

**Chapman Valve Mfg. Co.,** Booth 204. Chapmanizing process for heat treating.

**Chase Brass & Copper Co.,** Booth F-30. Copper alloys.

**Chicago Flexible Shaft Co.,** Booth 74. Heat treating furnaces.

**Chilton Co.,** Booth A-54. Publications.

**Cities Service Oil Co.,** Booth F-45. Lubricants, cutting oils.

**Cleveland Overall Co.,** Booth B-16. Safety clothes.

**Climax Molybdenum Co.,** Booth D-1. Molybdenum steels and irons.

**Coffing Hoist Co.,** Booth C-51. Various types of hoists.

**Colonial Alloys Co.,** Booth G-11. Stainless alloys and products, protective coatings.

**Columbia Steel Co.,** Stage. (See United States Steel Corp.)

**Continental Industrial Engineers, Inc.,** Booth 19. Heat treating machines and furnaces.

**Continental Machines, Inc.,** Booth B-46. Precision filing and sawing equipment.

**Copperweld Steel Co.,** Booth B-6. Quality steels, oxidation and corrosion resisting steels, tools and special steels.

**Cramp Brass & Iron Foundries,** Booth E-6. Bearings, bushings, castings.

**Crucible Steel Casting Co.,** Booth 298. Steel castings.

**Cyclone Fence Co.,** Stage. (See United States Steel Corp.)

**Daily Metal Trade,** Booth 70. Publications.

**Deemer Steel Casting Co.,** Booth 298. Steel castings.

**De Sanno & Son, A. P.,** Booth C-30. Abrasive cutting and grinding equipment.

**Despatch Oven Co.,** Booth 4. Gas heat treating furnaces.

**Detroit Electric Furnace Div.,** Booth E-50. Electric melting furnaces.

**Detroit Rex Products Co.,** Booth 282. Degreasing and cleaning agents.

**Detroit Testing Machine Co.,** Booth 208. Hardness and other testing machines.

**Diamond Iron Works, Inc.,** Booth 7. (See Mahr Mfg. Co.)

**Dieter Co., Harry W.,** Booth 258. Spectrographic and other analytical equipment.

**Disston & Sons, Inc., Henry,** Booth F-58. Saws, knives, piles, steel and tools.

**Do-All Eastern Machine Co.,** Booth B-46. Saw blades.

**Dodge Steel Co.,** Booth 298. Steel castings.

**Dow Chemical Co.,** Booth G-61. Magnesium alloy sand and die castings, extruded shapes, sheet and plate.

**Drever Co.,** Booth H-22. Drever industrial process for stainless steels, heat treating furnaces, controlled atmosphere equipment.

**Driver-Harris Co.,** Booth 214. Heat and corrosion resisting alloys.

**Eastman Kodak Co.,** Booth H-39. Industrial radiographic and X-ray equipment.

**Ecco High Frequency Corp.,** Booth C-38. High frequency converter equipment.

**Eclipse Fuel Engineering Co.,** Booth H. Heat treating furnaces, burners, valves and equipment.

**Eisler Engineering Co.,** Booths A-6 and A-50. Electric spot and butt welders.

**El Taller Mecanico Moderno,** Booth F-57. Publications.

**Elastic Stop Nut Corp.,** Booth G-31. Self-locking nuts.

**Electro Manganese Corp.,** Booth 90. Electrolytic manganese.

**Electroloy Co., Inc.,** Booth A-6.

**Empire Steel Castings Co., Inc.,** Booth 298. Steel castings.

**Eutectic Welding Alloys, Inc.,** Booth A-11. Welding alloys.

**Expert Welding Machine Co.,** Booth A-6.

**Farrand Foundry Corp.,** Booth G-38. Castings.

**Farrel-Birmingham Co.,** Booth 298. Rolls, machinery and castings.

**Federal Machine & Welder Co.,** Booth A-6. Electric spot, projection, butt and seam resistance welders and heaters.

**Federal Products Corp.,** Booth 286. Precision measuring instruments.

**Fieser and Lundt, Inc.,** Booth B. Gas burners, compressors, blowers.

**Firth-Sterling Steel Co.,** Booth 98. Carbide tools, stainless steel products, wear resisting parts.

**Foundry,** Booth 70. Publications.

**Foxboro Co.,** Booth F-12. Automatic control instruments.

**Franklin Institute,** Booth 94. Educational exhibit.

**Gardner Publications, Inc.,** Booth F-57. Publications.



# List of Firms Exhibiting at National Metal Exposition

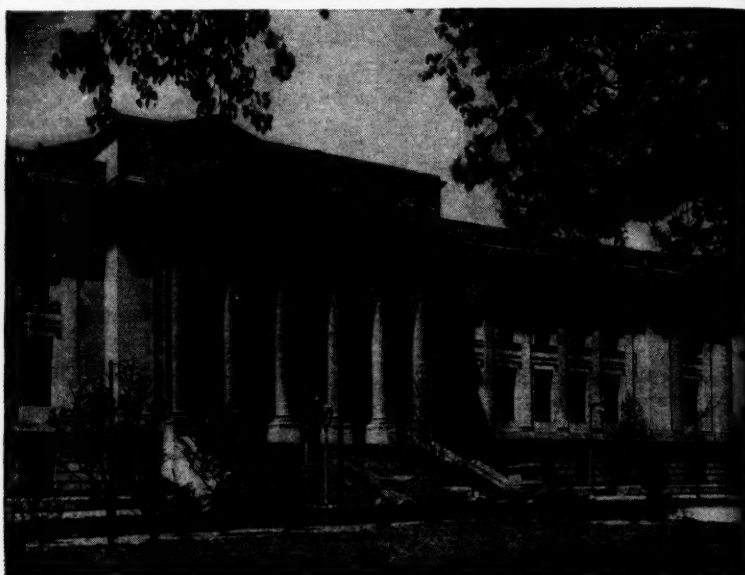
- Gehrich & Gehrich, Inc.**, Booth M. Ovens, dryers, air heaters.
- General Alloys Co.**, Booth 2. Heat and corrosion resistant alloys, furnace parts.
- General Electric Co.**, Booth 230. Electric furnaces, atmosphere controls, welding machines.
- General Electric X-Ray Corp.**, Booth 230. X-ray testing equipment, diffraction units.
- General Gas Light Co.**, Booth T. Gas unit heaters.
- General Steel Castings Corp.**, Booth 208. Railroad car and locomotive castings.
- Globar Division, Carborundum Co.**, Booth 236. Electric heating elements.
- Gordon Co., Claud S.**, Booth 208. Heat treating furnaces and supplies, steel cement, hardness testing equipment, pyrometer supplies.
- Great Lakes Steel Corp.**, Booth D-56. High tensile alloy steels.
- Grob Brothers**, Booth H-51. Die making equipment, saws, filing machines, brazing devices.
- Gulf Oil Corp.**, Booth G-36. Cutting oils.
- H & H Research Co.**, Booth 222. Portable electric tools.
- Hamilton Mfg. Co.**, Booth G-30. Drafting room furniture.
- Handy & Harman**, Booth C-40. Brazing solders and silver solders.
- Hardy, Inc., Charles**, Booth G-13. Metal powders and powder products.
- Harnischfeger Corp.**, Booth 82. Electric welding equipment and motors.
- Hartford Electric Steel Corp.**, Booth 298. Steel castings.
- Hauck Manufacturing Co.**, Booth A-23. Oil and gas burners, regulating valves.
- Hayes, Inc., C. I.**, Booth C-34. Heat treating furnaces.
- Heat Treating & Forging**, Booth B-33. Publications.
- Hevi Duty Electric Co.**, Booth E-30. Electric heat treating furnaces.
- Hild Floor Machine Co.**, Booth H-59. Industrial floor cleaning equipment.
- Hitchcock Publishing Co.**, Booth G-58. Publications.
- Hobart Brothers Co.**, Booth D-39. Arc welding equipment.
- Holliday & Co., W. J.**, Booth F-38. Speed case and speed treat steels.
- Holo-Krome Screw Co.**, Booth E-26. Socket screws.
- Hones, Inc., Charles A.**, Booth L. Pot and oven furnaces, industrial burners.
- Houghton & Co., E. F.**, Booth 60. Carburizing compounds, heat treating salts, lubricants, cutting oil, leather belting and packings.
- Hunt Spiller Mfg. Co.**, Booth 298. Air furnace, gun iron castings.
- Illinois Testing Laboratories, Inc.**, Booth 76. Pyrometers, thermometers, controllers.
- Independent Pneumatic Tool Co.**, Booth C-21. Portable electric and pneumatic tools.
- Induction Heating Corp.**, Booth G-26. High frequency induction equipment.
- Industrial Heating**, Booth 235. Publications.
- Industrial Press**, Booth C-13. Publications.
- Industrial Publishing Co.**, Booth A-26. Publications.
- Industry & Welding**, Booth A-26. Publications.
- International Nickel Co., Inc.**, Booth D-26. Nickel and nickel alloys.
- Iron Age**, Booth 296. Publications.
- Jackson Buff Co.**, Booth H-6. Buffing wheels.
- Jessop Steel Co.**, Booth 13. Alloy, stainless and tool steels, clad metals.
- Johns-Manville Corp.**, Booth H-12. Insulating and refractory materials.
- Jones & Laughlin Steel Corp.**, Booth 216. Hot and cold rolled steel.
- Kelly-Koett Mfg. Co.**, Booth C-57. Industrial X-ray equipment.
- Kemp Mfg. Co., C. M.**, Booth I. Gas producers and pre-mixers, industrial carburetors, dehydrators.
- Kent Co., Inc.**, Booth C-49. Maintenance equipment.
- King, Andrew**, Booth B-31. Consulting engineer.
- Krouse Testing Machine Co.**, Booth 212. Repeated stress testing machines.
- Kuhlman Electric Co.**, Booth E-50. (See Detroit Electric Furnace Div.)
- Latrobe Electric Steel Co.**, Booth 15. Castings, tool steels.
- Leach Machinery Co., H.**, Booth B-58. Machine tools.
- Lebanon Steel Foundry**, Booth 298. Electric steel castings.
- Leeds & Northrup Co.**, Booth 20. Heat treating furnaces, pyrometers and control instruments.
- Lepel High Frequency Laboratories**, Booth 229. High frequency converters.
- Lewis Machine Co.**, Booth C-58. Wire straightening and cutting machinery.
- L'Hommedieu & Sons Co., Chas. F.**, Booth E-44. Plating and polishing supplies.
- Lincoln Electric Co.**, Booth 40. Electric welding equipment and supplies.
- Lindberg Engineering Co.**, Booth 68. Heat treating furnaces and equipment.
- Maas & Waldstein Co.**, Booth A-15. Lacquers, enamels, metal finishes.
- MacDermid, Inc.**, Booth G-46. Plating and cleaning compounds.
- Machine Design**, Booth 70. Publications.
- Machine Tool Blue Book**, Booth G-58. Publications.
- Machinery**, Booth 23. Publications.
- Machinery Mfg. Co.**, Booth C-13. Machine tools.
- Macklin Co.**, Booth 274. Grinders and grinding wheels.
- Magnaflux Corp.**, Booth A-30. Inspection method and equipment.
- Magnetic Analysis Corp.**, Booth A-12. Magnetic analysis equipment.
- Mahr Mfg. Co.**, Booth 7. Oil and gas furnaces and burners.
- Malleable Iron Fittings Co.**, Booth 298. Pipe fittings, castings, galvanizing, tinning.
- Mallory & Co., Inc., P. R.**, Booths A-6 and 202. Welding electrodes, non-ferrous alloys for electrical apparatus and contacts, bi-metals.
- Manganese Steel Forge Co.**, Booth D-21. (See Audubon Wire Cloth Corp.)
- Manhattan Rubber Mfg. Co.**, Booth B-13. Abrasive cut-off and finishing wheels.
- Marburg Brothers, Inc.**, Booth 262. Jigs and special tools, toolroom machines.
- Matchless Metal Polishing Co.**, Booth G-34. Polishing compounds.
- Maurath, Inc.**, Booth D-31. Welding electrodes.
- McGraw-Hill Publishing Co.**, Booth 3. Publications.
- McKay Co.**, Booth E-38. Welding electrodes, industrial chain.
- McKenna Metals Co.**, Booth D-55. Carbide tools, wear resisting parts.
- Mears-Kane-Ofeldt, Inc.**, Booth S.
- Metal & Thermit Corp.**, Booth F-26. Welding electrodes and equipment, high purity metals.
- Metal Finishing**, Booth H-38. Publications.
- Metal Industry**, Booth B-56. Publications.
- Metal Progress**, Booth 215. Publications and educational exhibit.
- Metals & Alloys**, Booth A-38. Publications.
- Metlab Co.**, Booth 39. Heat treatment of metals.
- Midvale Co.**, Booth E-6. Large forgings, rolls, heat and corrosion resistant castings.
- Milburn Co.**, Booth H-37. Industrial skin protection materials.
- Minneapolis-Honeywell Regulator Co.**, Booth 63. Instruments and controllers.
- Modern Machine Shop**, Booth F-57. Publications.
- Molybdenum Corp. of America**, Booth E-42. Molybdenum and tungsten alloys, ferro-alloys, metal powders.
- Moreinis, D. A.**, Booth B-46. (See Do-All Eastern Machine Co.)
- Morse Magneto Clock Co.**, Booth B-35. Watchmen's clocks.
- Motch & Merryweather Machinery Co.**, Booth F-41. Metal sawing machines.
- Multi-Hydromatic Welding & Mfg. Co.**, Booth A-6.
- National Electric Welding Machines Co.**, Booth A-6. Electric welding equipment.
- National Industrial Publishing Co.**, Booth 235. Publications.
- National Machine Works**, Booth N. Industrial gas apparatus.
- National Time & Signal Corp.**, Booth B-63. Timing devices.
- National Tube Co.**, Stage. (See United States Steel Corp.)
- New Equipment Digest**, Booth 70. Publications.
- Nicholson File Co.**, Booth F-42. Files.
- Norton Co.**, Booth 290. Abrasive products, grinding wheels.
- Oakite Products, Inc.**, Booth 226. Metal cleaning materials and equipment.
- Office of Production Management, Division of Contract Distribution**, Booth C-22.
- Oficina Mecanico Moderno**, Booth F-57. Publications.
- Ohio Carbon Co.**, Booth F-39. Carbon brushes, contacts, resistors, etc.
- Ohio Crankshaft Co.**, Booth 264. Induction hardening equipment.
- Ohio Seamless Tube Co.**, Booth A-7. Seamless tubing, electric welded sections.
- Ohio Steel Foundry Co.**, Booth 22. Heat and corrosion resisting alloys.
- Olsen Testing Machine Co., Tinius**, Booth 277. Testing machines.
- Ozalid Products Div.**, Booth H-26. Printing and developing processes.
- Packer Machine Co.**, Booth H-6. Polishing and buffing machines.
- Page Steel and Wire Division, American Chain and Cable Co.**, Booth A-27. Welding wire and electrodes.
- Pangborn Corp.**, Booth C-46. Blast cleaning and dust collecting equipment.
- Park Chemical Co.**, Booth 279. Heat treating, buffing and polishing materials.
- Parker-Kalon Corp.**, Booth G-53. Screws and fastening devices.
- Partlow Corp.**, Booth F. Temperature control units.
- Patterson Co., P. A.**, Booth C-61. Tools and gages.
- Penn Steel Castings Corp.**, Booth 298. Steel castings.
- Pennsylvania Electric Steel Castings Co.**, Booth 298. Steel castings.
- Penton Publishing Co.**, Booth 70. Publications.
- Philadelphia Electric Co.**, Booth E-58. Industrial power service.
- Phillips Mfg. Co.**, Booth 266. Metal cleaning machines.
- Physicists Research Co.**, Booth 291. Profilometer and accessories for measuring surface roughness.
- Porter Cable Machine Co.**, Booth A-37. Grinders, electric saws, sanders.
- Potts Co., Horace T.**, Booth 250. Iron and steel products.
- Product Engineering**, Booth 3. Publications.
- Products Finishing**, Booth F-57. Publications.
- Progressive Welder Co.**, Booth A-6. Welding machines, punching units, riveting units.
- Pulmosan Safety Equipment Corp.**, Booth H-35. Industrial safety equipment.
- Quigley Co., Inc.**, Booth H-30. Refractories.
- Radium Chemical Co.**, Booth C-55. Radiographic equipment, radium.
- N. Ransohoff, Inc.**, Booth B-10. Metal cleaning equipment.
- Ransome Concrete Machinery Co.**, Booth B-17. Revolving welding tables.
- Reading Steel Castings Div., American Chain and Cable Co.**, Booth 298. Electric steel castings.
- Reeves Pulley Co.**, Booth A-53. Variable speed control equipment.
- Reinhold Publishing Co.**, Booth A-38. Publications.
- Republic Steel Corp.**, Booth D-36. Alloy and stainless steels, strip steel, wire products, pig iron, tin plate.
- Resistance Welder Manufacturers' Association**, Booth A-6. Information on resistance welding.
- Revere Copper & Brass Co.**, Booth 248. Copper, brass and bronze products.
- Rhoads & Sons, J. E.**, Booth A-57. Leather belting, packing, gaskets.
- Riehle Testing Machine Div.**, Booth D-29. (See American Machine and Metals, Inc.)
- Roebing's Sons Co., John A.**, Booth H-16. Wire rope, round, flat and shaped wire, insulated wires and cables.
- R-S Products Corp.**, Booth D. Gas heat treating equipment.
- Ruud Mfg. Co.**, Booth O. Water heaters.
- Ryerson & Son, Inc., Joseph T.**, Booth G-17. Alloy steels and steel products.
- Salem Engineering Co.**, Booth I. Industrial furnaces.
- Scherr & Co., George**, Booth A-42. Optical instruments and testing machines.
- Schrader's Son, A.**, Booth B-51. Valves, gages, brass fittings.
- Sciaky Bros.**, Booth 242. Spot welding equipment.
- Scully Steel Products Co.**, Stage. (See United States Steel Corp.)
- Selas Co.**, Booth E. Gas burners, furnaces, controllers.
- Sellers Engineering Co.**, Booth R. Industrial gas equipment.
- Sentry Co.**, Booth 8. Hardening furnaces, high temperature tube furnaces.
- Sleeper & Hartley, Inc.**, Booth B-1. Wire and spring making machinery.
- S-M-S Corp.**, Booth A-6. Welding electrodes, special alloys.
- Specialties Mfg. Co.**, Booth G-38. Lathe attachments.
- Spencer Turbine Co.**, Booth 35. Turbo compressors, gas boosters and vacuum cleaners.
- Standard Alloy Co.**, Booth 11. Heat and corrosion resistant alloys.

(Continued on page 14)

## Exhibitors at Metal Exposition

- Standard Pressed Steel Co.,** Booth A-58. Cap screws, shop equipment, power transmission appliances.
- Standard Steel Spring Co.,** Booth 203. Corrosion-proof coatings.
- Standard Steel Works Co.,** Booth E-6. Castings.
- Steel,** Booth 70. Publications.
- Steel Founders' Society,** Booth 298. Steel casting information.
- Steel Publications, Inc.,** Booth B-33. Publications.
- Stoody Co.,** Booth E-61. Hard facing alloys.
- Stuart & Co., D. A.,** Booth C-1. Industrial oils and greases.
- Summerill Tubing Co.,** Booth H-29. Aircraft and special tubing.
- Superior Tube Co.,** Booth H-46. Seamless and welded tubing.
- Surface Combustion Corp.,** Booth J. Heat treating furnaces, burners, accessories.
- Swift Electric Welder Co.,** Booth A-6. Butt, spot and projection welders.
- Synthane Corp.,** Booth G-35. Bakelite and Bakelite products.
- Tagliabue Mfg. Co., C. J.,** Booth 225. Pyrometers, thermometers, controllers, other instruments.
- Taylor-Hall Welding Corp.,** Booth A-6. Spot welders.
- Taylor Winfield Corp.,** Booths A-1 and A-6. Electric butt, spot and seam welders.
- Tempil Corp.,** Booth 28. Hardening and tempering pellets.
- Tennessee Coal, Iron & Railroad Co.,** Stage. (See United States Steel Corp.)
- Thomson-Gibb Electric Welding Co.,** Booth A-6. Resistance welding machines.
- Tide Water Associated Oil Co.,** Booth 202. Industrial oils and greases.
- Tinnerman Products, Inc.,** Booth 45. Fastenings for various assemblies.
- Titanium Alloy Mfg. Co.,** Booth F-16. Titanium, ferro-alloys, refractories.
- Towle & Son Co.,** Booth 11. Heat resisting alloys.
- Treadwell Engineering Co.,** Booth 208. Steel works equipment.
- Trent Co., Harold E.,** Booth A-59. Electric furnaces and heating elements.
- Triplex Machine Tool Co.,** Booth B-61. Automatic screw machines, hobbing machines.
- Tungsten Electric Corp.,** Booth G-54. Cemented tungsten carbide tools.
- Una Welding, Inc.,** Booth 207. Welding machines and supplies.
- United States Steel Corp.,** Stage. Alloy steels, high tensile steels, stainless steels.
- Vulcan Corp.,** Booth A. Vulcan Iron Works, Booth 298. Electric hoists, engines, machinery, steel castings.
- Wall Colmonoy Corp.,** Booth B-55. Hard facing alloys.
- Welding Engineer,** Booth H-53. Publications.
- Welding Machines Mfg. Co.,** Booth A-6. Resistance welding machines.
- Welding Sales & Engineering Co.,** Booth A-6. Automatic welding machines, electric arc welders.
- Wells Mfg. Corp.,** Booth E-54. Metal band saws.
- Westinghouse Electric & Mfg. Co.,** Booth E-1. Welding equipment, magnetic, high strength and brazing alloys.
- Wheelco Instruments Co.,** Booth 41. Pyrometers, thermometers, control equipment.
- Whistler & Sons, Inc., S. B.,** Booth G-50. Piercing dies.
- Wickwire Spencer Steel Co.,** Booth B-12. Wire and wire products.
- Wilson Sales Corp., Lee,** Booth F-6. Gas-fired furnaces.
- Wilson Mechanical Instrument Co.,** Booth 53. Rockwell hardness testers.
- Wire Association,** Booth A-34. Educational exhibit, publications.
- Wire & Wire Products,** Booth A-34. Publications.
- Yale & Towne Mfg. Co.,** Booth C-6. Materials handling equipment, hoists, industrial trucks.
- Yerger Co., Charles R.,** Booth H-51. Sawing, filing and lapping machines.

## Philadelphia's Franklin Institute



"Devoted to science and the mechanic arts", the 113-year-old Franklin Institute should be of particular interest to visitors at the Metal Congress.

## Emmons Lectures At Special Meeting

Reported by Fred P. Peters  
Associate Editor, Metals and Alloys

New Jersey Chapter—Shattering a summer-recess tradition of long standing, this Chapter organized a special meeting on the heat treatment of the molybdenum type high speed steels for Aug. 18, invited a ranking authority to give the lecture, solicited the active cooperation of local OPM officials, and actually packed 225 heat resistant heat treaters into the Essex House, Newark, for the occasion.

The lecture, by J. V. Emmons, metallurgist of Cleveland Twist Drill Co., was entitled "The Current Types, Heat Treatment and Uses of Molybdenum Type High Speed Tool Steels", and as the title indicates, covered broadly and objectively several varieties of such steels in addition to Mr. Emmons' own "Mo-Max" molybdenum-tungsten type.

Generally speaking, "good practice" in heat treating 18-4-1 high speed steel is good practice for molybdenum type steels—or conversely, heat treating

methods and equipment that are unsatisfactory for moly steels are likely to be bad for high tungsten steels, too. The currently greater availability of the molybdenum-tungsten type of high speed steels has led to some unusual new applications, in which they have often demonstrated unsuspected superiority, Mr. Emmons reported.

As an appropriate prelude to Mr. Emmons' practical instruction, the Chapter heard Philip McCullough, eastern regional co-ordinator of the OPM's Priorities Division, discuss the present status of priorities control.

"This war", he said, "is more a war of metals and metallurgy than any war we've had before". The nation or nations most skillfully handling the greatest amounts of metals will be eventual victors, he declared.

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Case School of Applied Science

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## Employment Service Bureau

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### Positions Open

**METALLURGIST:** Young, competent, with two or more years of commercial experience in heat treating and steel analysis. Plant located in Union County, N. J. Working conditions and equipment excellent. Box 10-5.

**CHEMIST AND METALLURGIST:** Age 49, family. B.S., University of Michigan, 1914. 27 years experience as chief chemist, chief metallurgist and technical research manager in rolling mill, machine tool, automotive, aircraft and office equipment industries. Box 10-25.

**SALESMAN:** Preferably 28 to 33 years of age. To represent prominent tool steel manufacturer in Cleveland-Pittsburgh area. Write stating qualifications and experience. Box 10-30.

**NAVAL ENGINEERS:** The Naval Service has urgent need for large numbers of young men who hold degrees in electrical engineering, mechanical engineering and metallurgy, and who are otherwise qualified for appointment as ensigns in the Naval Reserve. Those interested in such appointments should apply for enlistment in Class V-7. Further details may be obtained from the Bureau of Navigation, Navy Department, Washington, D. C.

**CIVIL SERVICE:** An examination has been announced to recruit technical and scientific aids for various Government agencies. The work covers research and testing in radio, explosives, chemistry, physics, metallurgy and fuels. Full information and application forms may be obtained from The U. S. Civil Service Commission in Washington, D. C., or from any first or second class post office.

**RESEARCH FELLOW:** With Bachelor's degree and background in physics for research on metals. One-half time research, one-half time class work toward Master's degree. Western United States. Salary \$800. Box 10-35.

### Positions Wanted

**YOUNG MAN, 24, married, family,** desires opportunity to work in metallurgical research laboratory to learn technique and be able to attend college after or before work. No experience to offer, but only a set determination to accomplish any task given and to acquire all knowledge possible so as to facilitate continuance of work on new processes. References. Box 10-10.

**METALLURGICAL ENGINEER, M.Sc.:** six years of practical experience in the ferrous field, including open-hearth, acid and basic, electric furnace, rolling, forging, heat treating, testing, research and production work covering practically all existing carbon and alloy steels, stainless and high speed. Excellent references. Location immaterial. Box 10-15.

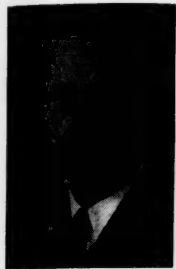
**METALLURGIST-SUPERVISOR:** Graduate in engineering and metallurgy. Employed in supervisory capacity. Experienced in both laboratory work and actual production of steel, seamless tubes, shells and bombs. Desires position as director of laboratory or supervisory head in metallurgical, inspection or operating departments. Box 10-20.

**RESEARCH METALLURGIST:** Especially qualified in physical metallurgy. Extensive experience with manufacture of cemented carbides and carbide tools. Desires position as a technician in research. Box 10-40.



## Harold Stein Dies, Was With Allis-Chalmers

HAROLD J. STEIN, 47, director of research, chemistry and metallurgy at the Allis-Chalmers Mfg. Co., Milwaukee, died Sept. 9. Mr. Stein directed these activities since 1939, when they were consolidated into one department upon the retirement of R. S. MacPherson, chief chemist.



H. J. Stein

Mr. Stein came to Allis-Chalmers as a student apprentice in 1916, served in various manufacturing departments and was in turn made general foreman of the company's heat treating operations, assistant foreman of the forge department and later a research engineer. In 1936 he was made chief research engineer of all the manufacturing departments of Allis-Chalmers.

Mr. Stein was born in Philadelphia and attended Tri-State College at Angola, Ind. He was a charter member of the Milwaukee Chapter A.S.M., and served as chairman during 1924-25.

### Waldemar Velguth

WALDEMAR VELGUTH, assistant chief metallurgist of Buick Motor Division, died August 22. He was 48.

Mr. Velguth, who was appointed to his position early this spring, is a graduate of the University of Wisconsin college of engineering in 1920. He had been associated with General Motors Corp. 21 years.

A member of the Detroit Chapter A.S.M., Mr. Velguth helped organize the Saginaw Valley Group in 1936. He served as chairman of the meetings and arrangements committee for three seasons, as a member of the first executive committee of the Group, and on the nominating committee in 1941-42.

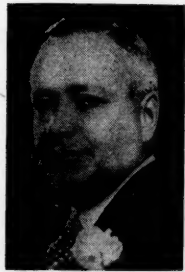
### Alvan Tracy Simonds

AUTHORITY on steel making and a pioneer advocate of the study of economics by all business executives, ALVAN T. SIMONDS, 64, president of Simonds Saw & Steel Co. of Fitchburg, Mass., died on Sept. 2.

After graduating from Harvard in 1899, he took a post-graduate course in metallurgy at Sheffield, England, then started work for the Simonds Mfg. Co. as laboratory assistant at its steel mill in Chicago. During the following ten years he was successively foreman of machine knives, and worked in the advertising, cost, entry, purchasing and sales departments.

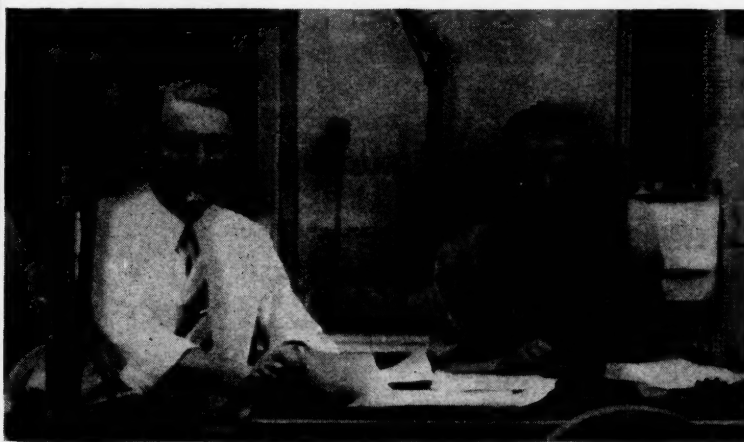
From 1910 to 1913 he was in charge of the erection and operation of a new mill for the tool steel department of the company at Lockport, N. Y., then became president of the firm that was afterwards named Simonds Saw & Steel Co.

For a year prior to the United States' entrance into the first World War, Mr. Simonds experimented on a steel helmet which in 1916 was universally worn by the soldier at the front. After war was declared the company offered its services to the Ord-



A. T. Simonds

## Boston Chapter Chairman Gives Broadcast



Boston Chapter Chairman G. H. Burnett Immediately after giving an A.S.M.-Sponsored Broadcast Over CBS Station WEEI at 4:30 p.m. August 9. At right is S. Novins, WEEI announcer. The program was part of a weekly feature entitled "New England in Defense."

nance Department at Washington, and Mr. Simonds was given supervision of purchase and production of helmets and similar material.

### Hugh A. Scallen

HUGH A. SCALLEN, 46, district manager for the New England branch and warehouse of the Jessop Steel Co. with offices at Hartford, Conn., died suddenly from a heart attack on Sept. 2.

Mr. Scallen had been affiliated with the tool steel industry for 23 years. He was a member of the American Legion, the City Club of Hartford, and the American Society for Metals.

## 400 Detroiters Show Eager Interest in Moly High Speed

Reported by Walter G. Patton  
Climax Molybdenum Co.

Detroit Chapter—The eager interest of Detroiters in molybdenum high speed steel was clearly evidenced by a turn-out of approximately 400 persons at Wayne University Auditorium on Thursday, Sept. 4. The meeting was called at the request of the Office of Production Management, to familiarize the membership of all technical societies in the Detroit area with the physical properties and heat treatment of molybdenum high speed steel.

Norman I. Stotz of Universal-Cyclops Steel Co. served as technical chairman, and presented Bradley Stoughton, chief, Heat Treating Equipment Unit, Tools Section, OPM, and president-elect of the A.S.M.

Mr. Stoughton outlined briefly the tight domestic situation with respect to tungsten supply and told of the work of a committee of experts who had cooperated to produce an excellent technical report on the subject of molybdenum high speed steel. (This report has been published in the September issue of METAL PROGRESS.)

Chief speaker of the evening was S. C. Grimshaw, metallurgist in charge of production at Latrobe Electric Steel Co. Compliments are very much in order for Mr. Grimshaw for a well prepared address—exceptionally well delivered in a clear and forceful manner.

The "questions and answers" part of the program was handled by Ray P. Kells, metallurgist in charge of heat treatment, also of Latrobe Electric Steel Co. Mr. Kells prefaced the discussion from the floor with a series of photographs illustrating properly heated, underheated and overheated types of molybdenum high speed steel.

## Metal Progress Wins Fourth Editorial Award

METAL PROGRESS, monthly magazine of the American Society for Metals has again received an award in *Industrial Marketing's* Annual Competition for Editorial Achievement.

Designated as a special award for the best typographical excellence maintained during the year ending July 31, 1941, it was presented on Sept. 17 during the National Industrial Advertisers Association Conference in Toronto. This is the fourth competition conducted by *Industrial Marketing* and the fourth award Metal Progress has received.

Soon to be off the press is the October annual Reference Issue of Metal Progress. Material in this year's issue will be subdivided into eight major branches of the metal industry. Featured will be special articles in each section on some phase of defense work in that field.

As in past years, the issue will carry a large selection of valuable engineering data sheets.

## Address Service Clubs

Talks dealing with metals and the metal industry and with the forthcoming National Metal Congress and Exposition have been presented by several members of the Philadelphia Chapter at some of the Service Clubs in the Philadelphia area.

Major Leslie S. Fletcher of Frankford Arsenal has presented six such talks at various towns in Pennsylvania and New Jersey. Other speakers include L. E. Eckholm, Francis B. Foley, Franklin H. Pennell, and T. H. Nelson.

## Committee Meetings at Show

A meeting of a special sub-group of Subcommittees 3 and 5 of A.S.A. B-16 has been scheduled for the week of the National Metal Congress by N. O. Smith-Peterson of the Walworth Co., chairman of the sub-group. The meeting will be held on Thursday, Oct. 23 at the Benjamin Franklin Hotel.

A meeting of Subcommittee IX of Committee E-4 of the American Society for Testing Materials will be held at 2:30 p. m. on Wednesday, Oct. 22. Samuel Epstein, of Bethlehem Steel Corp., is chairman.

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## Hartford Has Emergency Materials Committee to Aid Members & Industry

Hartford Chapter is the first Chapter of the American Society for Metals to appoint an Emergency Materials Committee.

This committee plans to have regular meetings and to be helpful in an advisory capacity to the members of the Hartford Chapter and to industry in the sphere of influence of the Chapter during the present emergency.

R. W. Woodward, engineer of tests, Underwood Elliott Fisher Co., is chairman of the committee, which consists of the following men:

Warren H. C. Berg, metallurgist, Pratt & Whitney Division.

Henry J. Chapin, metallurgist, Peck, Stow & Wilcox Co.

John A. Comstock, metallurgist, Pratt & Whitney Aircraft Division.

F. F. Harter, district sales manager, Universal-Cyclops Steel Corp.

L. A. Lanning, assistant plant manager, New Departure Division, General Motors Corp.

D. A. Nemser, metallurgist, International Nickel Co.

Erwin A. Sanford, chief chemist, Henry Souther Engineering Co.

H. W. Staples, chief metallurgist, Bristol Brass Corp.

Joseph L. Stone, field metallurgist, Union Drawn Steel Division, Republic Steel Corp.

## Authors of Papers Meet Daily to Discuss Details

An important factor in the smooth and prompt running of the technical sessions of the American Society for Metals during the annual National Metal Congress is a series of breakfasts held during the Convention.

At these breakfasts, which will be held in the Benjamin Franklin Hotel, Philadelphia, each morning during the Congress, the chairmen and co-chairmen of the technical sessions of that day and those who are presenting papers will meet with the chairman of the Publication Committee and A.S.M. Assistant Secretary Ray T. Bayless.

At this time the program for the day is gone over in detail, the discussions to be presented are given consideration, the amount of time allocated for each paper is emphasized, and every detail conducive to a successful and smooth-running meeting is considered.

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## Contract Distribution Division of OPM to Have Exhibit Space

(Continued from page 1)

cupy a large space, and will be prepared to give the same type of service as rendered at the various offices. Engineers will be on hand who will be prepared to assist and advise prime contractors (holding direct contracts from the Army, Navy, or Maritime Commission) on the possibilities of speeding production by sharing their contracts with sub-contractors.

This District has completed a survey of all machine tool facilities throughout the region, and now has a cross-indexed file of over 50,000 machine tools in more than 3500 plants. The file shows the name, type, age, capacity, and various other characteristics of each machine, including its condition and the tolerances to which it will work.

This information is instantly available to any prime contractor as to the nearest facilities available to produce anything desired in the form of sub-contracting, regardless of size, type, or precision demanded.

At the same time these engineers at the Contract Distribution Booth will be prepared to meet and advise with plant owners who are seeking sub-contractors.

While the Service does not award contracts nor enter into the negotiations, it does endeavor to bring together the prime contractors and possible sub-contractors.

Never was it more important for the smaller plant owners to be looking for defense work. Priorities will gradually make it more and more difficult for shops to secure materials for production of non-essentials and the far-seeing plant managers are now seeking ways and means of getting into production of essentials.

"It is important for plant owners to realize that defense contracts are not being handed out on a silver platter," said Dr. Gates. "This is a democracy and we are still living in a competitive economy. We can be thankful for that."

"And we should be willing to go out and fight for government business just as we do for our business in ordinary times. That is the democratic way. The only other way is the dictatorial way. And we don't want that."

"My advice is to try for government work, and when you fail try again and again. That's the only way this job can be done."

Those attending the Convention in Philadelphia will find it well worth their while to get acquainted with the OPM Engineers at the Exposition.

## Restaurant Service at Hall

As a convenience to members and guests arrangements have been made with one of Philadelphia's finest caterers, Milton H. Wiener, to handle the restaurant and lunch room facilities during the National Metal Exposition.

The Philadelphia Convention Hall has a splendidly equipped and decorated restaurant room and every facility for high-class service. Mr. Wiener has made a specialty of catering to conventions and will serve regular meals, short orders and sandwiches, as the member may wish. His firm has been in business for 103 years.

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# Guide to Metallurgical Books

**B**ECAUSE it is impossible to carry in one's head all the details of his industry, a well-rounded library of reliable data is a definite asset. Not only does it save his time, but it often makes his available knowledge of a subject more accurate and up-to-date.

You can assemble such a library from the books listed below—at low cost. These books include reliable information on every phase of the metal industry. They cover inspection of metals . . . strength of metals . . . modern steels . . . alloying elements . . . forging . . . machining of metals . . . hardenability . . . carburizing . . . stainless steels . . . open-hearth steel making . . . physical testing . . . heat treatment . . . tool steels . . . quenching . . . grain size . . . working of metals . . . age hardening . . . pyrometry . . . metallographic technique . . . etc.

### STRENGTH OF METALS UNDER COMBINED STRESSES

by Maxwell Gensamer, Associate Professor of Metallurgy, Carnegie Institute of Technology

The material presented in this book was delivered as an Educational Course in the 1940 Metal Congress at Cleveland. Principles that may be used already in practice in the resistance to deformation and relative ductility of metals under complex conditions are explained.

Chapters include . . . States of Stress and the Ductility of Metals . . . Resistance to Deformation . . . Resistance to Fracture . . . Applications of Principles.  
125 pages . . . 96 illustrations . . . 6 x 9  
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### PRINCIPLES OF HEAT TREATMENT

by Dr. M. A. Grossmann, Director of Research Carnegie-Illinois Steel Corp.

The author of this book, an outstanding authority on the subject, presented the context in a five-lecture series before the National Metal Congress. The book originally printed in 1935 was revised in 1937, and the 1940 edition has been greatly revised with an addition of some 100 pages. Thousands of copies of this book have already been sold to the metallurgical fraternity. It is a book that all metallurgists should have in their library.  
244 pages . . . 174 illustrations . . . 6 x 9  
red cloth binding . . . \$3.50

### VISUAL EXAMINATION OF STEELS

by George M. Enos, University of Cincinnati

This book, written by an authority in the field of visual examination of metals, discusses macroscopic technique . . . macro-etching and other methods of testing. In a comprehensive and fundamental way the author first distinguishes between macroscopic and microscopic technique, then covers applications to steel and choice of lenses and equipment for their examination. In addition to 156 helpful drawings, photographs and charts the book contains a comprehensive bibliography of the literature on cracks, grain size, macro-etching, sulphur and phosphorus printing. Typical photographs of the various methods of testing are included.  
120 pages . . . 156 illustrations . . . 6 x 9  
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### MODERN STEELS

Twelve lectures on the manufacture, inspection, treatment and uses of modern steels presented before the Pittsburgh A.S.M. Chapter.

Written from a fundamental point of view, this book makes involved aspects of modern steel metallurgy understandable even to the man with only a superficial engineering education. Can be used as school text—also for educational courses. Chapters cover raw materials and pig iron . . . steel making processes . . . steel pouring . . . hot working . . . inspection and testing . . . metallography . . . heat treatment . . . alloy steels . . . stainless steels . . . and tool steels.  
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